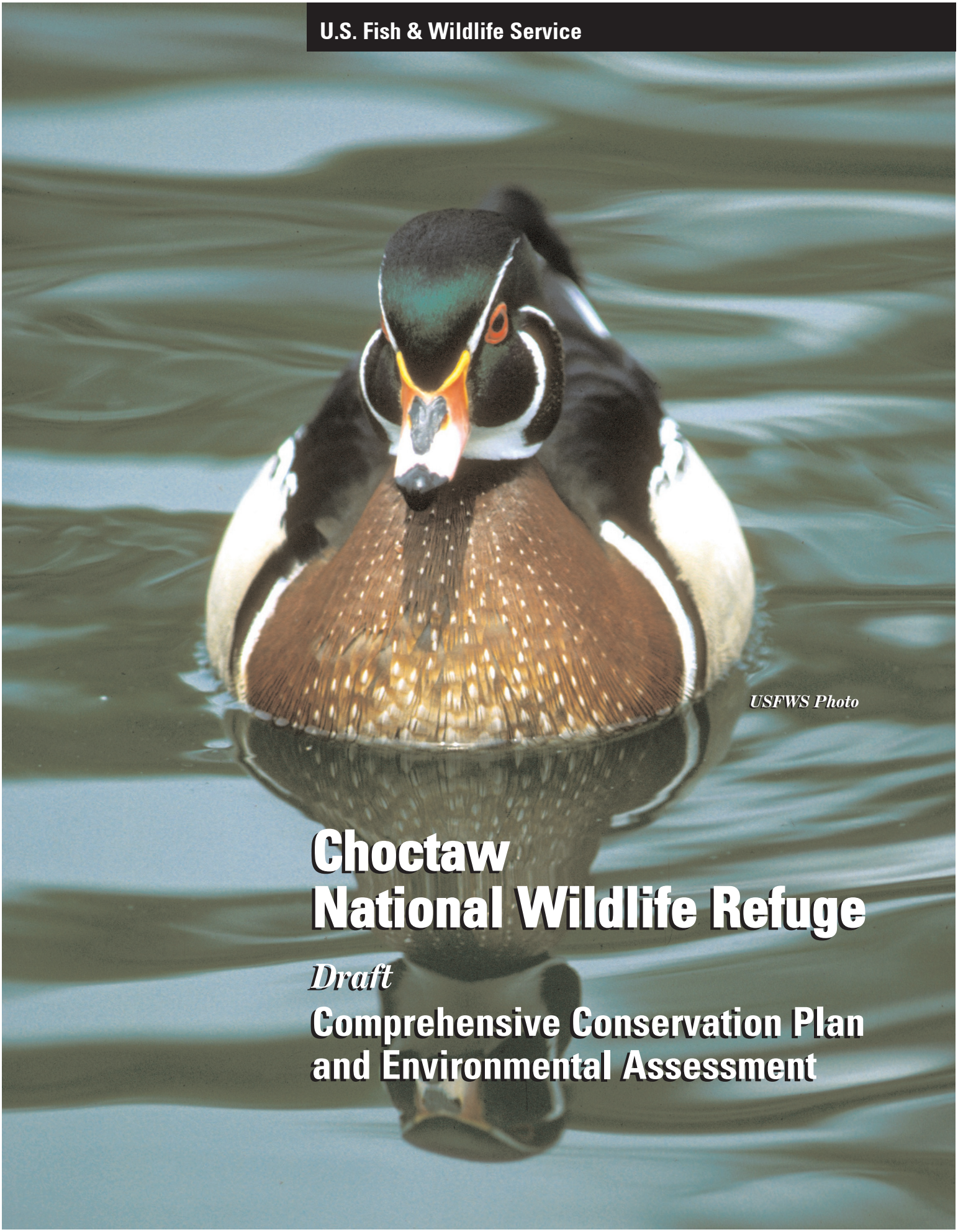
U.S. Fish & Wildlife Service



USFWS Photo

Choctaw National Wildlife Refuge

Draft

Comprehensive Conservation Plan and Environmental Assessment

Comprehensive Conservation Plans provide long-term guidance for management decisions; set forth goals, objectives, and strategies needed to accomplish refuge purposes; and identify the Fish and Wildlife Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

DRAFT
COMPREHENSIVE CONSERVATION PLAN
AND ENVIRONMENTAL ASSESSMENT

CHOCTAW NATIONAL WILDLIFE REFUGE

Choctaw County, Alabama

U.S. Department of the Interior
Fish and Wildlife Service
Southeast Region
Atlanta, Georgia

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SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. Background

INTRODUCTION

The U.S. Fish and Wildlife Service (Service) has developed this Draft Comprehensive Conservation Plan to provide a foundation for the management and use of Choctaw National Wildlife Refuge, headquartered in Jackson, Alabama. The plan is intended to serve as a working guide for the refuge's management programs and actions over the next 15 years.

The plan was developed in compliance with the National Wildlife Refuge System Improvement Act of 1997 and Part 602 (National Wildlife Refuge System Planning) of the Fish and Wildlife Service Manual. The actions described in this plan also meet the requirements of the National Environmental Policy Act of 1969. Compliance with the Act is being achieved through the involvement of the public and the inclusion of a Draft Environmental Assessment in Section B. When fully implemented, this plan will strive to achieve the vision and purposes of the refuge.

The plan's overriding consideration is to carry out the purposes for which the refuge was established. Fish and wildlife are the first priority in refuge management, and public use (wildlife-dependent recreation) is allowed and encouraged as long as it is compatible with, or does not detract from, the refuge's mission and purposes.

The plan has been prepared by a planning team composed of representatives from the refuge; a natural resources planner from the Service's Jackson, Mississippi, field office; staff from the Service's Daphne, Alabama, Ecological Services field station; the Alabama Division of Wildlife and Freshwater Fisheries; and the Mangi Environmental Group, a contractor. In developing this plan, the planning team and refuge staff incorporated a number of suggestions and recommendations from the U.S. Army Corps of Engineers; the Alabama Department of Conservation and Natural Resources; other federal, state, and local agencies; nongovernmental organizations; local citizens; the general public; and other stakeholders. This public involvement and the planning process itself are described in Chapter III, Plan Development.

The plan represents the Service's proposed alternative and is being put forward after considering three other alternatives, as described in the accompanying environmental assessment (Section B). After reviewing the public comments and management needs, the planning team developed these alternatives in an attempt to determine how to best meet the goals and objectives of Choctaw National Wildlife Refuge. Alternative D, the proposed alternative, is the Service's recommended course of action for the future management of the refuge, and is embodied in this plan.

PURPOSE AND NEED FOR THE PLAN

The purpose of this comprehensive conservation plan is to identify the role that Choctaw National Wildlife Refuge will play in support of the mission of the National Wildlife Refuge System, and to provide long-term guidance to the refuge's management programs and activities. The plan is needed to

- provide a clear statement of direction for future management of the refuge;
- provide refuge neighbors, visitors, nongovernmental partners, and government officials with an understanding of the U.S. Fish and Wildlife Service's management actions on and around the refuge;

- ensure that the Service's management actions, including its land protection, recreational, and educational programs, are consistent with the mandates of the National Wildlife Refuge System Improvement Act of 1997;
- ensure that the management of the refuge considers federal, state, and county plans; and
- provide a basis for development of the refuge's budget requests for operational, maintenance, and capital improvement needs.

A critical management consideration for the Service is to communicate with the public and include public participation in its efforts to carry out the mission of the National Wildlife Refuge System. Many agencies, organizations, institutions, businesses, and private citizens have developed relationships with the Service to advance the goals of the Refuge System.

This Draft Comprehensive Conservation Plan supports the Partners in Flight Initiative; the North American Waterfowl Management Plan; U.S. Shorebird and Wading Bird plans; the Central Gulf Coast Ecosystem Plan; Partners for Amphibians and Reptiles; and the American Woodcock Management Plan.

POLICIES AND LEGAL MANDATES

U.S. FISH AND WILDLIFE SERVICE

The mission of the U.S. Fish and Wildlife Service, working with others, is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.

The Service manages the 96-million acre National Wildlife Refuge System, comprised of more than 540 national wildlife refuges, thousands of small wetlands, and other special management areas. It also operates 66 national fish hatcheries, 64 fishery resource offices, and 78 ecological services field stations. The agency enforces federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

NATIONAL WILDLIFE REFUGE SYSTEM

The National Wildlife Refuge System manages more than 96 million acres on refuges throughout the nation, including Puerto Rico and the Virgin Islands. It is world's largest network of lands specifically managed for the benefit of fish and wildlife.

The mission of the System, as defined by the National Wildlife Refuge System Improvement Act of 1997, is:

> *… to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

The National Wildlife Refuge System Improvement Act of 1997 established, for the first time, a clear mission of wildlife conservation for the National Wildlife Refuge System. The Act states that each refuge shall be managed to:

- fulfill the individual purpose of each refuge;
- fulfill the mission of the Refuge System;
- consider the needs of fish and wildlife first;
- fulfill the requirement of developing a comprehensive conservation plan for each unit of the Refuge System, and fully involve the public in the preparation of these plans;
- maintain the biological integrity, diversity, and environmental health of the Refuge System;
- recognize that wildlife-dependent recreational activities, including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation are legitimate and priority public uses; and
- retain the authority of refuge managers to determine compatible public uses.

Following passage of the Act in 1997, the Service immediately began efforts to implement the direction of the new legislation, including the preparation of comprehensive conservation plans for all refuges. The development of these plans is ongoing nationally. Consistent with the Act, all comprehensive conservation plans are being prepared in conjunction with public involvement, and each refuge is required to complete its plan within a 15-year schedule.

Approximately 38 million people visited America's national wildlife refuges in 2002 to observe wild living things in their diverse natural habitats. As this visitation continues to grow, significant economic benefits are being generated to local communities that surround the refuges. Economists have reported that national wildlife refuge visitors contribute more than $400 million annually to the local economies. In 2001, 82 million U.S. residents aged 16 years and older fished, hunted, or observed wildlife, generating $108 billion in the process. In a study completed in 2002 on 15 refuges in 14 states around the nation, visitation had grown 36% in seven years. At the same time, the number of jobs generated in surrounding communities grew to 120 per refuge, up from 87 jobs in 1995, pouring more than $2.2 million into the local economies. Other findings also validate the belief that communities near refuges benefit economically. Expenditures on food, lodging, and transportation grew to $6.8 million per refuge, up 31% from $5.2 million in 1995. For each federal dollar spent on the Refuge System, surrounding communities benefited with $4.43 in recreation expenditures and $1.42 in job-related income (Caudill and Laughland 2003).

Volunteerism continues to be a major contributor to the successes of the Refuge System. In 2002, thousands of volunteers contributed more than 1.5 million person-hours on refuges nationwide, a service valued at more than $22 million.

The wildlife and habitat vision for the national wildlife refuges stresses the following principles:

- Wildlife comes first.
- Ecosystems, biodiversity, and wilderness are vital considerations in refuge management.
- Refuges must be healthy.
- Growth of refuges must be strategic.
- The National Wildlife Refuge System serves as a model for habitat management with broad participation from others.

OTHER LEGAL MANDATES

Administration of national wildlife refuges is guided by the mission and goals of the National Wildlife Refuge System, congressional legislation, presidential executive orders, and international treaties. Policies for management options of refuges are further refined by administrative guidelines established by the Secretary of the Interior and by policy guidelines established by the Director of the Fish and Wildlife Service. Please refer to Appendix III (Section C) for a complete list of the relevant legal mandates.

By law, lands within the National Wildlife Refuge System are closed to public uses unless specifically opened. The Service must evaluate all programs and uses based on the mandates set forth in the National Wildlife Refuge System Improvement Act of 1997. These mandates are to:

- contribute to ecosystem goals, as well as refuge purposes and goals;
- conserve, manage, and restore fish, wildlife, and plant resources and their habitats;
- monitor the trends of fish, wildlife, and plants;
- manage and ensure appropriate visitor uses, as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public (these uses include hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation); and
- ensure that visitor activities are compatible with refuge purposes.

NATIONAL AND REGIONAL CONSERVATION PLANS AND INITIATIVES

Along with enhanced communication with the public, increased public agency participation has been determined to be one of the most pressing needs of the Service. A number of partnerships have been developed among public and private entities—agencies, organizations, institutions, and businesses—to address environmental issues affecting the ecosystem, region, and nation. Conservation initiatives that have been borne out of these relationships address declining trends in the natural, physical, social, and economic environments with broad-scale planning and cooperation between affected parties.

Restoring the functions and values of wetlands in the southeastern United States is a top priority. The goal is to prioritize and manage wetlands to most effectively maintain and possibly restore the biological diversity in the ecosystem. Some areas are prioritized as focus areas for reforestation.

It is widely recognized, however, that most of the acreage of forested wetlands that have been cleared and converted to other uses in the Central Gulf Coast Ecosystem will not be reforested. Some areas would have lower value for reforestation and so are targeted for intensive management for nonforest-dependent species, such as waterfowl and shorebirds. Through combining efforts, apportioning resources, and focusing available programs, the ecosystem's biological diversity can be improved. This Draft Comprehensive Conservation Plan supports the Central Gulf Coast Ecosystem Plan; the Partners in Flight Initiative; North American Waterfowl Management Plan; U.S. Shorebird and Wading Bird plans; Partners in Amphibian and Reptile Conservation; and the American Woodcock Management Plan.

CENTRAL GULF COAST ECOSYSTEM PLAN

The restoration, recovery, and protection of pine habitats and associated plant and animal communities are the goals for the Service's Central Gulf Coast Ecosystem Plan, in which Choctaw

National Wildlife Refuge is located. Historically, the longleaf pine community was the predominant vegetative community of the southeastern coastal plain, with roughly 60 percent coverage in upland areas (U.S. Fish and Wildlife Service 2003a). Choctaw, however, is situated in the valley and floodplain of the Tombigbee River and is dominated by bottomland hardwoods.

The Central Gulf Coast Ecosystem Team developed a five-year plan that addresses refuge contributions. The management priorities for migratory birds, as identified for Choctaw National Wildlife Refuge, are as follows:

- Maintain healthy bottomland hardwood forests (increase plant species diversity and vertical layers of vegetation).
- Control populations of feral swine to protect other native wildlife and plant communities.
- Restore and protect critical functions of riverine and adjacent aquatic habitats with emphasis on water quality, invasive plant control, and excessive sedimentation.

PARTNERS IN FLIGHT

Growing concern about declines in many land bird species not covered by existing conservation initiatives led to the launching of Partners in Flight in 1990. Partners in Flight is an international cooperative effort of government agencies, philanthropies, professional organizations, conservation groups, industry, academics, and private individuals. Its initial focus was on neotropical migrants—species that breed in North America and winter in Central and South America—but its emphasis has now expanded to encompass most land birds and other species requiring terrestrial habitats. Partners in Flight has a number of initiatives underway, including a North American Landbird Conservation Plan. This plan is voluntary and nonregulatory, and focuses on relatively common species in areas where conservation actions can be most effective, rather than the frequent local emphasis on rare and peripheral populations. Partners in Flight's main premise is that the resources of public and private entities in the Americas, both North and South, must be combined, coordinated, and increased if success in conserving hemispheric bird populations is to be achieved (Partners in Flight n.d.).

NORTH AMERICAN WATERFOWL MANAGEMENT PLAN

The North American Waterfowl Management Plan took flight in 1986 with the signing of an agreement between Canada and the United States; Mexico later joined the program in 1988. The Plan provides a policy framework for analyzing North American waterfowl issues. It also sets out a number of objectives relating to waterfowl habitat and populations, with a focus on conserving and expanding wetland areas (Environment Canada 2004).

The North American Waterfowl Management Plan is based on the principle of joint ventures that serve as a framework for the activities of the Plan's private and regional member agencies. These partners coordinate their efforts in pursuit of common objectives for waterfowl protection in each region, province, or state.

U.S. SHOREBIRD CONSERVATION PLAN AND WADING BIRD PLAN

The U.S. Shorebird Conservation Plan and Wading Bird Plan are partnership efforts throughout the United States to ensure that stable and self-sustaining populations of shorebird and wading bird species are restored and protected. The plans were developed by a wide range of agencies, organizations, and experts for separate regions of the country. They identify conservation goals, critical habitat conservation needs, key research needs, and proposed

education and outreach programs to increase awareness of shorebirds and the threats they face (U.S. Fish and Wildlife Service n.d.b).

Choctaw National Wildlife Refuge is an important location for breeding shorebirds and transient species during both northbound and southbound migrations. In order to mitigate or reverse the deleterious impacts from an array of development-related pressures, Choctaw will contribute to the following goals of the Shorebird and Wading Bird plans:

- Improve forest midstory and understory using appropriate forest harvest methods for tree removal (also establish experimental harvest cuts to observe responses).
- Identify wood stork concentration areas and limit disturbance if nesting occurs. Assess potentials for fish foraging ponds.
- Consider impoundments and sanctuary for waterbirds (e.g. herons, egrets) and shorebirds.
- Identify swallow-tailed kite potential nest sites and monitor for use.
- Recognize need for tree snags for such species as the prothonotary warbler and great crested flycatcher.
- Locate and map any rookeries and protect from disturbance.
- Participate in Christmas Bird Count and other bird census and survey opportunities.
- Establish point counts for surveying forest-breeding birds (will require additional staff).
- Initiate surveys of marsh birds on the refuge and their associated habitat use.

PARTNERS IN AMPHIBIAN AND REPTILE CONSERVATION

The Partners in Amphibian and Reptile Conservation (PARC) was founded in 1998 to address the need for conservation of herpetofauna—amphibians and reptiles—and their habitats (Partners in Amphibian and Reptile Conservation 2004). Its mission is to conserve amphibians, reptiles, and their habitats as integral parts of the ecosystem and culture, through proactive and coordinated public and private partnerships. PARC's first organizational meeting was attended by more than 200 individuals from over 170 organizations and agencies, including representatives from federal and state agencies; conservation organizations; museums; nature centers; universities; research laboratories; the forest products industry; the pet trade industry; and environmental consultants and contractors, including participants from 33 states, the District of Columbia, Canada, and Mexico.

Choctaw National Wildlife Refuge will contribute to the following goals of PARC:

- Complete a baseline study of the refuge's amphibian and reptile populations.
- Maintain the quality of wetlands (water quality). Monitor water quality trends and/or obtain Corps of Engineers or state data to track trends.

AMERICAN WOODCOCK MANAGEMENT PLAN

Woodcock trends in the United States have been declining annually for the last 15 years in spite of actions that have been taken to ensure that hunting does not substantially promote declines, such as reduced bag limits and limited season lengths. An American Woodcock Management Plan, initiated in the 1990s, points out the need for improved breeding, migration, and wintering habitat to enhance population growth and survival (McAuley and Clugston n.d.). Much of the decline is thought to be caused by land use changes and the maturing of forest habitats that result in less early successional shrub/scrub habitats preferred by woodcock.

Choctaw National Wildlife Refuge will contribute to the following listed goals of the American Woodcock Management Plan:

- In a few open agriculture/old field areas, conduct nocturnal surveys to determine use.
- If appropriate (based on woodcock night use data), consider improvement of some upland fields for roosting woodcock.
- Create additional dense forest understory via appropriate forest harvest techniques (e.g., small/moderate group selection openings). Also favor and maintain dense "cane" areas on the refuge.

CENTRAL GULF COAST ECOSYSTEM CONTEXT

OVERVIEW

Sustainable communities and species conservation and recovery require the joint efforts of private landowners and local communities, as well as state and federal governments. This synergy of federal, state, tribal, and private organizations working together will ensure that the Service not only protects the more important areas, but also reduces redundancy of effort, allowing precious resources to be directed where they are most needed.

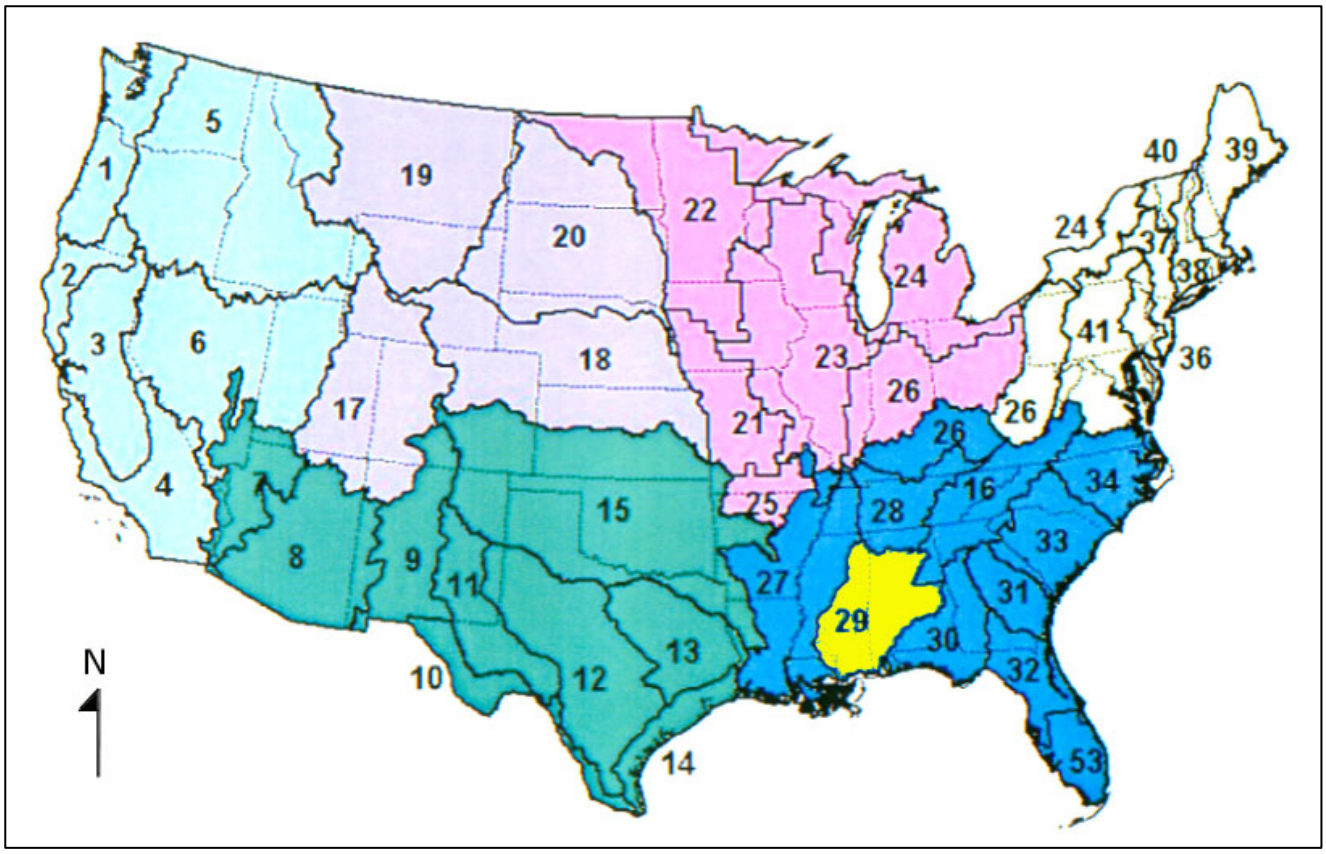
In approaching its mission to conserve wildlife and their habitats throughout the country, the U.S. Fish and Wildlife Service has found it useful to divide the entire United States into 53 distinct ecosystems, drawn primarily along watershed boundaries (Figure 1). Choctaw National Wildlife Refuge lies within the Central Gulf Coast Ecosystem (denoted as no. 29 in Figure 1). The refuge is an active participant in conservation efforts within this ecosystem, which spans portions of Mississippi, Alabama, and Georgia.

Much of the Central Gulf Coast Ecosystem is characterized by a flat to rolling topography broken up by numerous streams and river bottoms. The uplands are dominated by pines; longleaf and slash in the south, originally, and shortleaf mixed with hardwoods in the north. These are fire-maintained systems that give way to loblolly pine and hardwoods in the damper areas, and to bottomland hardwood forests in the extensive lowland drainages. Within its southernmost reaches, the ecosystem encompasses estuaries and coastal waters and includes saline, brackish (mixed saline and fresh) and fresh waters, as well as coastlines and adjacent lands. Coastal dunes, strands, offshore barrier islands, and tidal marsh, in addition to the freshwater wetlands, pine woodlands, and live oak forests, are all interrelated parts of the functioning whole. As such, they each figure as crucial habitat for coastal fish and wildlife. Today, the ecological health of the Central Gulf Coast Ecosystem is significantly degraded in comparison to its historical baselines. The Choctaw Refuge is located in the southern portion of the ecosystem.

MOBILE BAY BASIN

Choctaw National Wildlife Refuge lies on the western edge of the Mobile Bay Basin watershed, one of three watersheds that comprise the Central Gulf Coast Ecosystem. Mobile Bay receives its drainage from almost two-thirds of Alabama, plus portions of Georgia, Mississippi, and Tennessee. It encompasses 44,000 square miles and portions of 10 physiographic provinces, making it the sixth largest drainage basin in the United States (Chadron State College and U.S. Geological Survey n.d.). Defined by their soils, geology, topography, and other physical features, each of the 10 physiographic provinces imparts a unique set of chemical and physical characteristics to the waters that flow through them. As such, the Mobile River Basin provides a wide variety of different habitats for many species of plants and animals, including the bottomland hardwoods and backwater habitat of the Choctaw Refuge. Furthermore, the basin's isolation by time and geologic events (like the last continental Ice Age about 10,000 years ago) has resulted in a high number of endemic species found nowhere else in the world.

Figure 1. U.S. Fish and Wildlife Service-designated ecosystems in the conterminous United States.



As a result of habitat loss and degradation, the Mobile Bay watershed is experiencing biotic extinctions at a very high rate. Historically, the basin's endemic fauna included 40 species of fishes, 33 mussels, and 110 aquatic snails, as well as a number of species of turtles, aquatic insects, and crustaceans. Today at least 16 endemic mussel and 38 endemic aquatic snail species are presumed to be extinct, most within the past few decades. Not counting terrestrial wildlife, the basin has 32 aquatic animal and plant species that are currently protected under the Endangered Species Act of 1973, including two species of turtles, ten species of fish, 17 species of mussels, one snail species, and two species of plants. At least 62 other species are being reviewed as candidates for possible future listing. These imperiled species represent all levels of the aquatic food chain and include plants, insects, crustaceans, snails, mussels, fish, and turtles. A stable and healthy ecosystem is defined as one where the chance of species extinction is low. Thus, the high number of extinct and imperiled species from a variety of aquatic habitats throughout the basin—from small mountain streams to large coastal plain rivers—is a clear indication of an ecosystem in trouble.

ECOLOGICAL THREATS AND PROBLEMS

Habitat Loss and Fragmentation

Over the past two centuries, as civilization has spread throughout the region, ever-increasing needs for transportation, housing, water supply, electricity, food, and waste disposal have led to

dramatic alterations of the landscape. The greatest alteration has been from land clearing for agriculture and flood control projects.

Although these changes have allowed people to settle and earn a living, they have had a tremendous negative impact on biological diversity, biological integrity, and environmental health of the Central Gulf Coast Ecosystem. National wildlife refuges in the Central Gulf Coast have come to serve as part of the final safety net to support biological diversity—the greatest challenge, in fact, facing the Service.

For coastal habitats located along the Gulf, the underlying threats to biological diversity include:

- loss, alteration, and fragmentation of high quality coastal habitat due to development;
- loss of natural shorelines as a result of development, hydrologic modifications, natural erosion, bulkheading, shoreline armoring, and inadequate coastal engineering;
- lack of monitoring and regulation to protect fish and wildlife resources; and
- increased demand for beach access and use, resulting in increased disturbances to wildlife.

More generally, the threats to biodiversity across the variety of habitat types represented in this ecosystem are posed by invasive species; overuse of resources; pollution; global climate change; improper practices of fire suppression; and, most of all, habitat loss and fragmentation.

As a consequence of these threats, all manner of habitats in this ecosystem have seen their acreages reduced. Forested wetlands, marshes, oyster reefs, and seagrass beds are disappearing rapidly. Alabama has lost 25,000 acres of wetlands and bay bottoms in the Mobile-Tensas Delta alone. Immense areas of bottomland hardwood forests have been reduced to forest fragments. These range from a few large areas of more than 10,000 acres that have maintained many of the original functions and values of bottomland hardwood forests, to very small tracts just a few acres in size possessing limited functional value.

Elimination and fragmentation of coastal habitats have decimated wildlife species throughout the Gulf Coast, and are recognized by the Service as serious threats to wildlife in Alabama. The species most adversely affected by fragmentation are those that are area-sensitive or require special habitat, such as protected, undisturbed beach dunes that offer secure breeding habitat and a particular food source. Fragmentation affects migratory songbirds, sea turtles, beach mice, and many other species, primarily through high rates of nesting failure and predation. While more than 370 species of breeding migratory songbirds, shorebirds, waterfowl, and raptors are found in this region, some of these species have declined significantly, such as the red-cockaded woodpecker and Bachman's warbler. These species need the benefits of large, managed forest blocks to recover and sustain their existence.

As a result of habitat loss and degradation, the Central Gulf Coast Ecosystem, particularly that part coincident with the Mobile Bay watershed, is experiencing biotic extinctions at a rate unparalleled elsewhere in the United States. Within the last century, nearly 50 percent of U.S. biotic extinctions have occurred in the region (U.S. Fish and Wildlife Service n.d.a). Species once abundant in the Central Gulf Coast that have since become endangered or threatened include the endangered wood stork and the threatened bald eagle (which has been proposed for delisting). The most highly endangered of all is the ivory-billed woodpecker, which was once dependent on extensive old-growth swamp forests dominated by ancient cypresses, and is currently thought by many to be extinct. Until credible, but still disputed, sightings in early 2004 of at least one individual at Cache River National Wildlife Refuge in the Big Woods of eastern Arkansas, the last confirmed sighting of an ivory-bill was back in the 1940s.

The avian species most adversely affected by fragmentation include those that are area-sensitive (dependent on large continuous blocks of hardwood forest); those that depend on forest interiors; those that depend on special habitat requirements like mature forests or a particular food source; and those that depend on good water quality. Species such as the prothonotary warbler, cerulean warbler, and, in particular, Bachman's warbler, have declined significantly, and will require the benefits of large, managed forest blocks to recover and sustain their existence.

Fragmentation of bottomland hardwood forests has left many of the remaining forested tracts as biological oases surrounded by inhospitable agricultural lands. Intensive agriculture has removed most of the forested corridors along sloughs that formerly connected forest patches. The loss of connectivity between the remaining forested tracts hinders the movement of a large range of wildlife between tracts, and reduces the functional value of many remaining smaller forest tracts. The severed connections also result in a loss of gene flow needed to maintain genetic viability and diversity within wildlife populations. Thus, the remaining wildlife populations are rendered even more vulnerable to habitat modification and degradation. Particularly for wide-ranging species, reestablishing travel corridors to allow movement is of critical importance.

ALTERATIONS TO HYDROLOGY

The natural hydrology of a region is directly responsible for the connectedness of forested wetlands and indirectly responsible for the complexity and diversity of habitats through its effects on topography and soils. Natural resource managers recognize the importance of dynamic hydrology to forested wetlands and waterfowl–habitat relationships.

In addition to the loss of vast acreages of bottomland-forested wetlands and other habitat types, significant alterations have occurred in the region's hydrology due to development; river channel modifications; flood control levees; reservoirs; and deforestation, as well as degradation to aquatic systems from excessive sedimentation and contaminants.

Large-scale, man-made hydrological alterations have changed the spatial and temporal patterns of flooding throughout the entire watershed, in terms of both extent and duration of flooding, in comparison with the natural hydrology regime. This curtailing of the flooding regime has had an enormous impact on the forested wetlands and their associated wetland-dependent species.

In coastal estuaries, the saline stratification and location of the saltwater wedge can be impacted due to atypical levels of freshwater influxes. Factors affecting the level of freshwater inflow include erosion, sediment load changes, river runoff and pollution, dredging, and severe weather disturbances. It is difficult to disentangle the individual contributions of and interaction between human-induced factors and naturally occurring events; however, the overall impact on both vegetation and animal habitats within the Mobile Bay Delta is detrimental.

The Mobile Bay Basin ranks among the top ten river basins in the world in diversity of freshwater mussels, and third in the nation in variety of fishes (U.S. Fish and Wildlife Service n.d.a). Furthermore, almost 40 percent of North America's aquatic turtle species inhabit the drainages of the Mobile Bay Basin. Seagrass beds serve as nurseries for many animal species including fish, shrimp and crabs. In fact, of the commercial fish and shellfish landed in Alabama, an estimated 90 percent rely on grassy wetlands as critical habitat at some point in their life cycles. Thus, as a consequence of the destruction of many established seagrass beds in the Mobile Bay estuary serving as oyster and mussel habitat, more than $200 million in commercial and sport fishing revenue is estimated to have been lost between 1954 and 1978 (Chadron State College and U.S. Geological Survey n.d.). Besides natural factors such

as drought, increased turbidity and other water quality problems, invasive species and changes in water flow regimes from upstream dam construction are fingered as primary contributing factors in this decline.

Dams, locks, levees, and other channel modifications have exacted a price by fragmenting the aquatic habitats of species in the basin that depend on free-flowing rivers. The impounding of waters at 28 major dams, coupled with other development-related alterations, has resulted in widespread changes in flow, substrate, and water quality in river and stream habitats. The result has been the reduction of ecological function throughout the Mobile Bay Basin, including on the Tombigbee River.

Southeastern states have the greatest numbers of imperiled and vulnerable freshwater fish species in the country. Sixty-one species are at risk in Alabama alone, where channel modifications and pollution have gradually eliminated large populations of native aquatic species, including fish, mussels, snails, insects, and crustaceans. Barriers to movement prevent anadromous fish, including striped bass, gulf sturgeon, and Alabama shad, from reaching spawning grounds and key habitat areas. Many other aquatic species have similarly become isolated. Without avenues for migration, impacts from land surface pollution runoff are heightened. Restoration of structure and functions of a natural wetland is complicated by the fact that wetlands depend on a dynamic interface of hydrologic regimes to maintain water, vegetation, and animal complexes and processes.

SILTATION OF AQUATIC ECOSYSTEMS

Over a century ago, floodwaters and storms recharged aquatic and terrestrial habitats and created rich, dynamic systems that supported a diverse abundance of fish and wildlife species. Currently, however, water quality is significantly impacted by agricultural and industrial runoff. Rivers and water bodies throughout the ecosystem are filling in with silt. They are highly turbid, laden with pesticides, and support a small fraction of the once abundant aquatic resources. Declines in fish, wildlife, and habitats have prompted the Service to designate coastal habitats found in this ecosystem as areas of special concern.

Aquatic systems, including lakes, rivers, sloughs, and bayous, have been degraded as a result of deforestation and hydrologic alteration. Clearing of bottomland hardwood forests has led to an accelerated accumulation of sediments and contaminants in all aquatic systems. Many water bodies are now filled with sediments, greatly reducing their surface areas and depths. Concurrently, the nonpoint source runoff of excess nutrients and contaminants is threatening the area's remaining aquatic resources.

Hydrologic alterations have basically eliminated the geomorphological processes that created oxbow lakes, sloughs, and river meander scars. The protection, conservation, and restoration of these aquatic resources consequently take on an added importance in light of the alterations associated with flood control and navigation.

PROLIFERATION OF INVASIVE AQUATIC PLANTS AND ANIMALS

Compounding the problems faced by aquatic systems is the growing threat from invasive aquatic plants, such as alligator weed and willows. Static water levels caused by the lack of annual flooding and reduced water depths resulting from excessive sedimentation have created conditions favorable for the establishment and proliferation of several species of invasive aquatic plants. Additionally, the introduction of exotic (nonnative) vegetation capable of aggressive growth is further threatening the viability of aquatic systems. These invasive aquatic plants threaten the natural aquatic vegetation important to aquatic systems, and choke waterways to a degree that often prevents recreational use.

Various species of nonnative wildlife and fish also flourish in this temperate climate. Animals like the nutria and wild hog compete with native wildlife for limited resources, and have caused extensive habitat damage and alterations.

RELATIONSHIP TO THE ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

A provision of the National Wildlife Refuge System Improvement Act of 1997, and subsequent policy, is that the Service shall ensure timely and effective cooperation and collaboration with other federal agencies, state fish and wildlife agencies, and tribal governments during the course of acquiring and managing refuges. This cooperation is essential in providing for the protection and sustainability of fish and wildlife throughout the United States. State wildlife management areas, state parks, and national wildlife refuges together provide a sound foundation for the protection of species, and contribute to the overall health and sustainment of fish and wildlife in the State of Alabama.

The Alabama Department of Conservation and Natural Resources manages and protects the state's fish and wildlife resources through conservation enforcement officers in each county statewide and through fisheries and wildlife biologists (Alabama Department of Conservation and Natural Resources 2004). The ADCNR manages 24 state parks, 23 fishing lakes, three fish hatcheries, two waterfowl refuges, two wildlife sanctuaries, a mariculture center, and 34 wildlife management areas. The agency has responsibility for more than 645,000 acres of trust lands set aside for wildlife purposes. Additionally, the ADCNR provides and directs public recreation opportunities, including an extensive hunting and fishing program on several wildlife management areas and parks located near the refuge.

The participation of the ADCNR's Division of Wildlife and Freshwater Fisheries throughout this comprehensive conservation planning process has been valuable. In July, 2004, the Division's District V office in Spanish Fort, Alabama, provided both space and staff time for the development of Choctaw's vision statement, goals, objectives, and management strategies. The Division continues to work with the Service to foster ongoing opportunities for an open dialogue with the public, with the goal of improving the ecological sustainability of fish and wildlife in Alabama. The Division staff has not only participated in the refuge's biological reviews, public scoping meeting, and workshops as part of the planning process, they are also an active partner in the coordination and planning of annual hunting and fishing programs, various wildlife and habitat surveys, and efforts to control invasive aquatic species. A key part of the comprehensive planning process is the integration of common goals and objectives between the Service and the Division, where appropriate.

II. Refuge Description

INTRODUCTION

Choctaw National Wildlife Refuge occupies 4,218 acres of land that were obtained as part of a U.S. Army Corps of Engineers' Coffeeville Lock and Dam water development project on the Tombigbee River. However, the Corps continues to retain fee simple title to the property on which the refuge is located. In January 1964, under an agreement with the Corps, the Department of the Interior acquired management rights in perpetuity and began managing in accordance with the purposes of the refuge, which were to provide for the public benefit, wintering habitat for migratory waterfowl, nesting and brood-rearing habitat for wood ducks, and protection to alligators.

The refuge is located in Choctaw County in southwest Alabama, 80 miles north of Mobile on the west bank of the Tombigbee River (Figures 2 and 3). The refuge boundary starts two river miles upstream from the Coffeeville Lock and Dam.

The refuge is part of a territory that once belonged to the Choctaw Nation of Indians, which was ceded by the treaties of Mount Dexter (1805) and Dancing Rabbit (1830). Little remains of this Indian history, except for the names of several local streams. Okatuppa Creek, for example, comes from *Okakatapa*, or "water dammed up," a description still valid today.

Lakes, sloughs and creeks comprise over 40 percent of the refuge. Only 151 acres consist of openings or clearings such as farm fields or most soil units. The remainder, or 2,265 acres, is composed of typical bottomland hardwood associated with the Tombigbee River Basin. Overall, refuge management includes moist soil units, farming operations, forest improvements, and wetland manipulations and protection. While various objectives fall within the mission of Choctaw National Wildlife Refuge, the overriding thrust is to provide and maintain optimum habitat for wood duck production, along with wintering areas for migratory ducks.

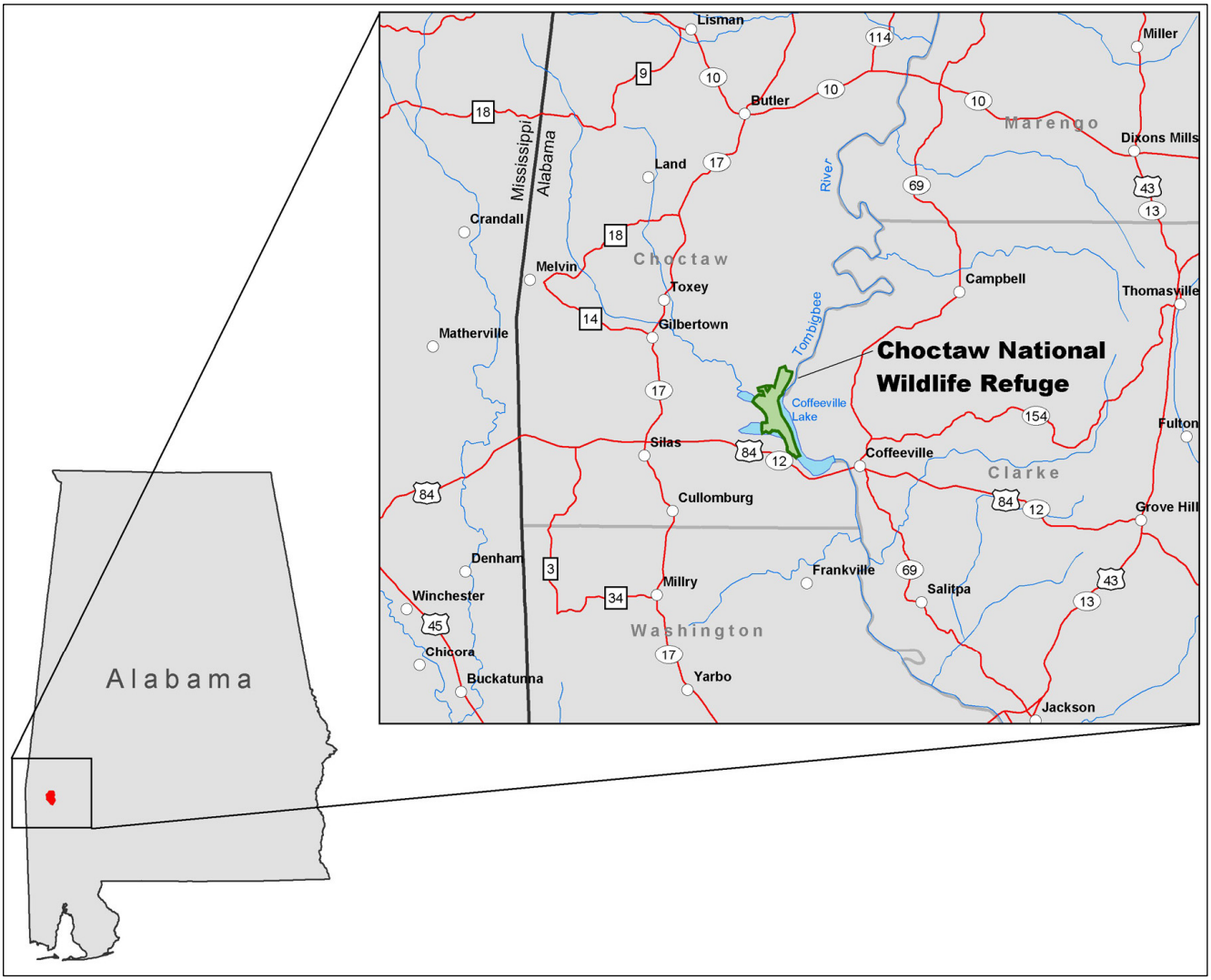
Because much of the refuge is underwater and inaccessible for several months every year, the refuge headquarters is located in Jackson, Alabama, a 45-minute drive to the south. The refuge has four full-time employees, two based at the headquarters and two at the refuge itself (Table 1). The refuge's approved acquisition boundary has no private inholdings. There are no plans for an expansion of the acquisition boundary at this time.

In September 2004, Choctaw was hit hard by Hurricane Ivan, which caused extensive flooding and downed many trees.

Table 1. Acres managed by current staffing, Choctaw National Wildlife Refuge

Refuge Headquarters	Refuges Managed	Acres Managed	Refuge Staff
Located in Jackson, Alabama	Choctaw NWR	4,218 acres in refuge	Refuge Manager (GS–12) Office Assistant (GS–7) Equipment Operator (WG–9) Equipment Operator (WG–9)
Total Refuge Staff			**4**

Figure 2. Regional location map of Choctaw National Wildlife Refuge



REFUGE PURPOSES

The refuge's mission is to provide for the public benefit, wintering habitat for migratory waterfowl, nesting and brood-rearing habitat for wood ducks, and protection to alligators. Special emphasis is placed on the endangered and threatened species that use the refuge: the bald eagle (currently being considered for delisting) and wood stork. Table 4 lists the refuge's establishing legislation and purposes.

Most public use activities center around fishing the refuge's backwaters and creeks. Observing and photographing birds and other wildlife are enjoyed throughout the year, particularly during the spring and winter months. Hunting on the refuge includes archery hunts for deer and feral hogs, and gun hunts for squirrels, rabbits and raccoons.

Figure 3. Vicinity map of Choctaw National Wildlife Refuge

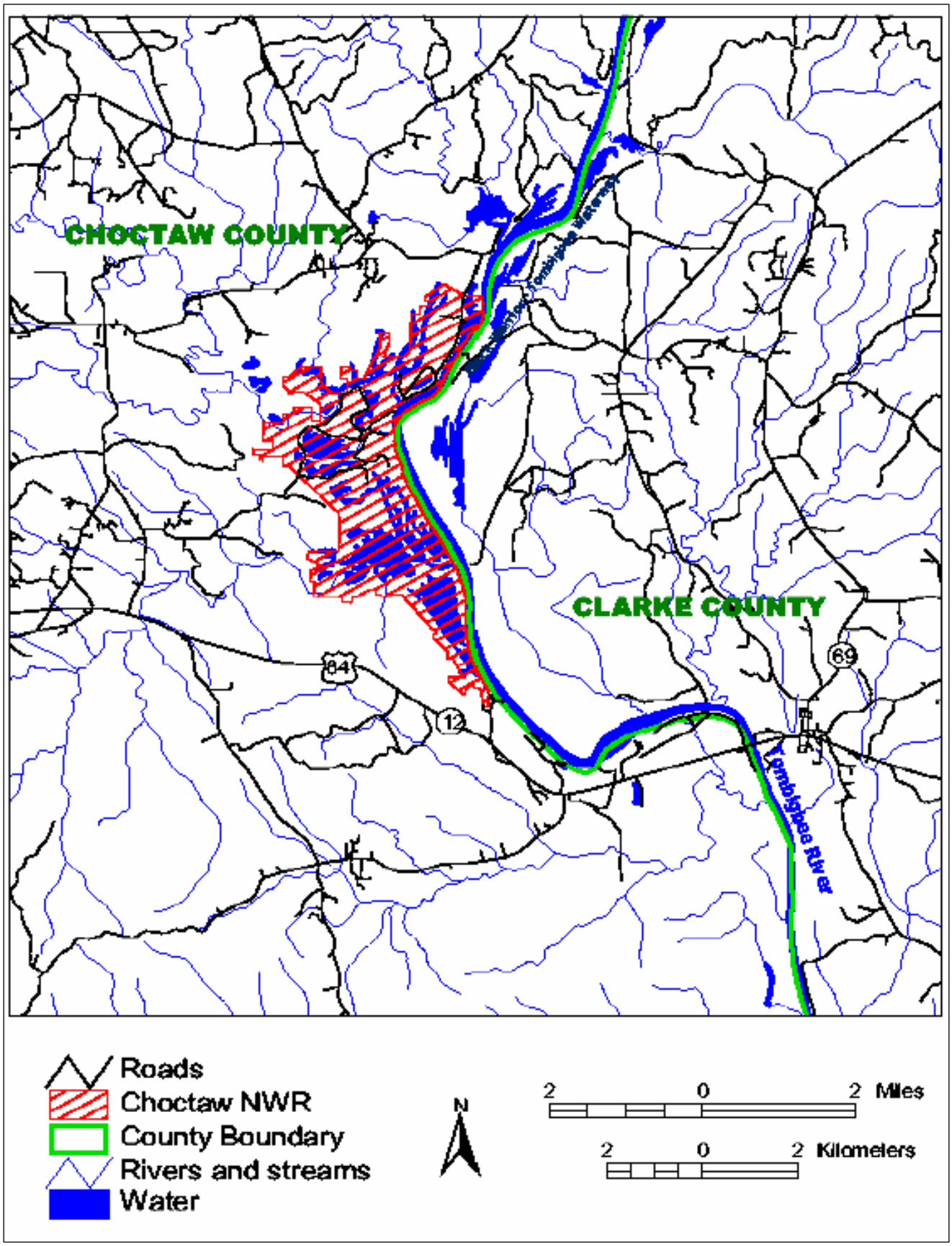


Table 2. Land acquisition history, Choctaw National Wildlife Refuge

Year	Choctaw NWR (acres)
1964	4218*
TOTAL	**4218**

*Property owned by the U.S. Army Corps of Engineers.
Source: NMRC 2004 Public Use Statement

Table 3. Location of the refuge

Refuge	County	Location
Choctaw NWR	Choctaw	80 miles north of Mobile, on west bank of Tombigbee River

Table 4. Establishment date, legislation, and purposes for Choctaw National Wildlife Refuge

Refuge	Year Established	Establishing Legislation	Refuge Purpose
Choctaw	1964	Fish and Wildlife Coordination Act Transfer of Certain Real Property for Wildlife Conservation Purposes Act of May 1948	"…for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon…" "…carrying out the National Migratory Bird Management Program…"

WINTERING HABITAT FOR WATERFOWL

Choctaw National Wildlife Refuge is located in the outer reaches of the Mississippi Flyway, in which a large portion of North America's wintering waterfowl seek seasonal refuge from the harsher conditions prevailing in the more northern habitats. The refuge provides important foraging and resting (sanctuary) habitats within the Central Gulf Coast Ecosystem for migratory ducks and geese, particularly wood ducks. Approximately five to eight thousand ducks are typically surveyed as monthly peaks on the refuge. While these numbers are not as high as the peaks on many other waterfowl-focused refuges, they nonetheless represent a large number within Alabama.

The refuge fits into the large-scale, collaborative planning and habitat management efforts of the North American Waterfowl Management Plan, described previously in Chapter I. The Plan involves partnerships among federal, state, provincial, tribal, and local governments; businesses; conservation organizations; and individual citizens. In addition to advancing waterfowl conservation, the Plan's partnership conservation projects also make substantial contributions toward the conservation of other wetland-associated species and migratory birds. At the end of 2003, Plan partners had invested more than $2.2 billion to protect, restore, and enhance more than eight million acres of habitat across North America.

Waterfowl wintering areas have been determined as significantly contributing to the spring breeding population objectives of the North American Waterfowl Management Plan by providing sufficient habitat and food to ensure adequate winter survival. Of the different types of habitat required, the availability of foraging habitat is typically the limiting factor for waterfowl populations.

The North American Waterfowl Management Plan has established rough objectives for food production according to habitat type for the complex of habitats, which include harvested and unharvested croplands, moist soil areas, and flooded forestlands. Each of these habitats is required to provide an important food source (such as native weed seeds, small grains, and invertebrates) required by waterfowl wintering on the refuge. Agricultural grains high in carbohydrates (i.e., "hot foods") are needed by waterfowl to maintain body temperature during cold periods in winter. Acorns and native weed seeds (such as the seeds of moist soil plants) and invertebrates provide higher levels of protein and other nutrients used by waterfowl to complete essential functions during the winter period. These include molting and egg-laying, as well as retaining or recovering overall health and fitness for the long migration to northern breeding grounds.

NONGAME BIRDS

Forest-dependent Birds

Choctaw National Wildlife Refuge is located within the Partners in Flight Southeastern Coastal Plain Bird Conservation Region (BCR #27) and potentially plays an important role in the welfare of birds in the southeastern United States. Despite being highly fragmented, the region's productive hardwood forests figure importantly in providing migration and breeding habitat for forest-breeding birds, as well as those that depend on forests for other activities such as foraging or wintering.

Many interior forest-breeding birds, such as the cerulean warbler and swallow-tailed kite, are known to require ample core forest areas to support their foraging and nesting needs. A core forest area is defined as a contiguous block of interior forest that is 1.6 miles from all forest edges. Because the Choctaw Refuge does not have sufficient interior forest acreage to support such a core forest area, and it currently has no plans to expand beyond its current approved acquisition boundary, its role in providing habitat for neotropical migrants dependent on large undisturbed forest blocks is limited.

Research has shown that up to 20–30 percent of a study tract can be degraded by fragmentation before neotropical migrant songbirds begin treating a contiguous tract as separate patches. Managed early successional openings of between one and five acres that serve as habitat for resident and migratory wildlife game species are not considered to impact the block nature of the forest tract (U.S. Fish and Wildlife Service 2003b).

Shrub-Scrub Dependent Birds

Shrub-scrub (or early successional) associated birds are another group of vulnerable avian species within the Southeast. Even more than for species needing mature core forest areas to flourish, opportunities may exist to promote shrub-scrub species conservation through the establishment and maintenance of shrub-scrub sites through the refuge, including at edges and in small blocks in forest clearings and thinned areas.

Shrub-scrub species have been noted to withstand cowbird and depredation problems better within smaller blocks of habitat (i.e., 50–100 acres; possibly as small as 25-acre patches) than mature forest priority species, which often require thousands of contiguously forested acres. Sites selected for long-term maintenance of shrub-scrub will require periodic disturbances.

One particular species of interest, the American woodcock, has shown significant long-term declines in the eastern United States over the last 15 years. Much of this decline is thought to be a result of land use changes and the maturing of forest habitats, resulting in less early successional shrub/scrub habitats preferred by woodcock. The refuge has prioritized woodcock/quail management as an explicit objective (along with other game species such as white-tailed deer and wild turkey), and can perhaps make a modest contribution to the Service in meeting its objectives in the American and regional woodcock management plans. The American Woodcock Management Plan, initiated in the 1990s, stresses the need for improved breeding, migration, and wintering habitat to enhance population growth and survival.

Wintering habitat for woodcock most often includes moist bottomland hardwood forests with brush and understory, especially when found in close association with agricultural fields and old field succession. These sites are typically wet thickets with a high density of plant stems with the ground open and having mostly leaf litter. Typical cover includes privet, cane, sweet gum sapling stands, and briars that result from openings in the canopy.

Migrating Shorebirds

Peak shorebird migration is expected April to mid-May (but extends from mid-March to late May). Southbound migration starts in early July, peaks from August through September, and ends by mid-October. Throughout the Southeastern Coastal Plain, sufficient habitat for spring (northward) shorebird migration was probably provided historically in most years with normal rainfall and evaporation rates. However, this is no longer the case due to losses in recent decades. Disruption of normal evaporation patterns over the last 50 years in the Central Gulf Coast, a lack of rainfall in this highly modified hydrological environment, human development patterns, and altered levels of freshwater inputs have led to a severe shortage of fall habitat for shorebirds.

Shorebird species known to use the refuge include the abundant killdeer, the spotted sandpiper, the lesser yellowlegs, and the common snipe. The least sandpiper, a moderate priority species cited by the U.S. Shorebird Conservation Plan, may also use the refuge. Shorebirds have not been surveyed on the refuge to date (U.S.Geological Survey n.d.; Choctaw National Wildlife Refuge n.d.a; Hunter et al. 2002).

Marshbirds

At the time of this plan development, marshbird use of Choctaw National Wildlife Refuge is poorly known. Suitable habitat does not seem to exist on the refuge; what there is occupies the fringe areas of backwater habitats and impoundments scattered throughout the refuge. Marshbird use likely occurs during migration and winter by species such as rails and bitterns; a few species may breed in

small numbers. The refuge's moist soil units and unmanaged herbaceous marsh dominated by cattail, rushes, and other perennials constitute the primary habitats. Management for these species coincides well with ongoing wetland restoration practices on the refuge, and to a lesser degree, management practices targeting waterfowl. Included in this group are "secretive marshbirds" (such as rails, bitterns, grebes, moorhens, and coots) and raptors (most notably the northern harrier, short-eared owl, and loggerhead shrike).

Habitat for Colonial Waterbirds/ Wading Birds

The Choctaw Refuge provides excellent habitat for post-breeding waterbirds, as evidenced by the number of wood storks and other wading birds observed during the late summer and early fall at the Blue Field Area. This area, as well as other shallow water impoundments scattered throughout the refuge, provide critical foraging opportunities for long-legged wading birds such as herons, egrets, and ibis during the late summer and fall. High priority waterbirds include the little blue heron, tricolored heron, and white ibis. Of moderate priority are the anhinga, snowy egret, and black-crowned night heron. Local Interest waterbirds include the pied-billed grebe, great egret, yellow-crowned night heron, and wood stork.

The primary management tools for the refuge are (1) protecting rookeries from disturbance and, where possible, maintaining standing water under nest trees throughout the nesting season to minimize nest predation by raccoons; (2) incorporating water level management for wading birds into shallow water management for waterfowl and shorebirds; and (3) determining the feasibility of using an existing small impoundment and/or establishing a new one to provide small fin fish. In the shallow water provided for wading birds, they will be searching for foraging habitat rich in small fish and crustaceans, a much different food source than is targeted in waterfowl and shorebird management.

REPLICATING HISTORIC FOREST CONDITIONS

A high percentage of the forestlands in the Central Gulf Coast Physiographic Plain has been cleared and converted to other land uses, leaving only remnant, fragmented forested tracts. Fish and wildlife resources have been similarly impacted, leaving remnant populations that must be managed to meet refuge purposes and to achieve their maximum potential. Some of the most unique forested habitats remaining in the region are forested ridges. Because of the importance of the remaining bottomland hardwood forests to the wildlife resources on the refuge, as well as conservation priorities set forth in various plans, forest resources should be managed to mimic old-growth forests and increase vertical vegetative structure.

Several species of waterfowl heavily use flooded forested habitat in winter for resting and foraging for acorns, other fruits, various seeds, and invertebrates. Mallards, teal, and wigeon all rely on flooded forested habitat as one of the complexes of preferred habitats. Wood ducks seek these areas almost exclusive of other habitats, and in fact, are year-round residents.

Unfortunately, flooding of all lands below 33.0 feet mean sea level (greater than 50 percent of the refuge) can occur at anytime due to Corps of Engineers needs, and to barge or other water level requirements associated with the Tennessee-Tombigbee Lock and Dam System. Essentially, except for a few moist soil impounded areas (fewer than 40 acres), the refuge is at the mercy of flood and overflow waters, which carry silt loads that are deposited on the refuge. Annual spring floods typically inundate 90 to 99 percent of the Choctaw Refuge. Positive actions taken to improve waterfowl habitats are, for the most part, limited to maintenance and regeneration of mast-producing hardwoods; improved water management capability on the few

moist soil areas; a wood duck nesting box program; some beaver pond management; establishment of sanctuary areas at key periods; and cooperation and agreements with the state and Corps to help reduce growing season flooding.

SPECIAL DESIGNATIONS OF THE REFUGE

Choctaw National Wildlife Refuge has one specially designated area, the Tupelo Gum Research Natural Area (SAF103). It was officially designated on October 29, 1976, and consists of 30 acres of water tupelo and five acres of bald cypress. The area is to be protected from beaver damage. This research natural area has never been subject to systematic study or monitoring.

RESOURCE THREATS AND PROBLEMS

Like every national wildlife refuge, Choctaw faces its share of resource-related challenges. The following describes the more problematic of these threats and problems.

Lack of control over water level management. All habitats on the refuge, including aquatic, terrestrial, and wetland habitats, are subject to operation of the Coffeeville Lock and Dam by the U.S. Army Corps of Engineers. Lock and dam operation is governed principally by navigational needs along the Tombigbee River, rather than by the needs of wildlife habitat or wildlife-dependent recreation on the refuge. Thus, during much of the year (winter months primarily), most of the refuge is flooded and water levels are too high both for forest regeneration and access to refuge lands. High water levels also exacerbate the sedimentation that is presently filling in many of the sloughs and backwaters on the refuge.

Invasive aquatic vegetation encroachment. Every year, emergent aquatic weeds—most of them nonnatives—proliferate on the surface of the backwaters, creeks, and bayous within the refuge. This infestation often renders these waters inaccessible to boats and anglers. It also affects dissolved oxygen levels and aquatic habitat structure, and contributes to the filling in of these habitats.

Loss and degradation of aquatic habitats. This is related to the previous two items. The backwaters, sloughs, and creeks that comprise much of the refuge are becoming shallower and filling in over time, due to sedimentation and the proliferation of aquatic weeds.

Forest habitat management and succession. Understory and midstory conditions have gradually been worsening for forest wildlife, both mammals and birds, as the closed-canopy forest matures. The regeneration and recruitment of mast-producing oaks, in particular, are not occurring sufficiently. In recent years, the refuge has not been able to implement forest management techniques such as tree harvests, thinning, or creation of openings that would reverse this undesirable trend.

Feral swine (hogs). A high population of feral hogs displaces native wildlife and damages the forest floor, adversely affecting soils and habitat and hindering forest regeneration.

Inaccessibility of the refuge. The refuge itself is located about 45 minutes by car from its headquarters in Jackson, Alabama. There is no professional staff regularly at the refuge, either to mange and monitor resources and wildlife or to interact with visitors.

REFUGE ENVIRONMENT

The 4,218-acre Choctaw National Wildlife Refuge is separated into three land masses by two creeks. Okatuppa Creek divides the north end from the Middle Swamp, and Turkey Creek separates the Middle Swamp from the south end.

Approximately 1,802 acres of the refuge are in lakes, sloughs, and creeks. Only 151 acres consist of openings such as old fields, croplands, and moist soil units. The remaining 2,265 acres are composed of typical bottomland hardwoods associated with the Tombigbee River Basin. This includes an approximately 35-acre tupelo gum natural area in the Middle Swamp region. Refuge management includes moist soil units, farming operations, forest improvements, and wetland manipulations and protection. The flooding regime on the refuge is under the influence of meteorological variations, the Army Corps of Engineers' dam operations, refuge management, and beavers, in that order, with an area of less than 40 acres equipped with water control devices.

The refuge has been focusing on providing wintering habitat for migratory waterfowl, and nesting and brood-rearing habitat for wood ducks. The wood duck, as well as the hooded merganser, use the artificial nesting boxes erected for them. Special emphasis has also been placed on three federally endangered and threatened species—bald eagles, wood storks, and American alligators (formerly endangered)—which use the refuge. Waterbirds are next in the hierarchy of management priorities.

The refuge also manages for compatible, wildlife-dependent recreation. Fishing is the most common public use activity, and is pursued in the backwaters and creeks. Bird watching and other wildlife observation and photography activities are enjoyed throughout the year, but particularly during the spring and winter months. Hunting on the refuge includes archery hunting for deer and feral hogs, and gun hunting for squirrels, rabbits, and raccoons. In the spring of 2002, a special two-day muzzleloader hunt for feral hogs was implemented.

As with many other refuges in the Southeast, the Service has no ownership interest in the subsurface rights at Choctaw National Wildlife Refuge. However, management efforts extend to encouraging nominal communication from oil and gas stakeholders in order to limit the impacts of their operations on the refuge.

PHYSICAL RESOURCES

Climate

Choctaw County, Alabama, has a humid, warm-temperate, continental climate typical of the southeastern United States. The average yearly rainfall in nearby Silas, Alabama, is almost 60 inches, with rainfall reasonably well distributed throughout the year, although winter is the wettest season. January is the wettest month at 6.8 inches and October the driest at 3.1 inches (City-data.com n.d.). Tropical storms or hurricanes coming from the Gulf of Mexico may occasionally bring several days of heavy rain. Thunderstorms, which usually bring the heaviest rains, are rarely accompanied by hail and tornadoes. Drought conditions during the summer may increase the danger of fire. The average annual snowfall is less than an inch.

January is usually the coldest month, with an average temperature of 47 degrees Fahrenheit. July is normally the hottest, with temperatures averaging about 80 degrees. Winters are mild, with temperatures seldom remaining below freezing for long. Summers are hot and humid with heat indexes commonly reaching 110 to 115 degrees. The average growing season is 226 days, from March 24 to November 6 (University of Alabama 2004). The statewide average temperature in July 2004 was 79.9 degrees Fahrenheit. This was -0.1 cooler than the 1895–2004 average. The

temperature trend for the period of record (1895 to the present) is 0.0 degrees Fahrenheit per decade (National Climatic Data Center 2004).

Physiography, Geography, and Soils

Choctaw National Wildlife Refuge is situated on the west bank of the Tombigbee River and lies within the greater Mobile Bay Watershed. The refuge's 4,218 acres are almost equally divided between shallow impoundments of Okatuppa and Turkey creeks and somewhat higher lands composed of wooded islands and seasonally flooded hardwood bottomlands. The terrain near the refuge's western boundary rises abruptly, with the habitat changing from river basin to wooded hills and ridges, which are characteristic of the timber country of south Alabama.

Soils are typical for river bottomlands in Mississippi and Alabama. The alluvial soils in the bottomlands of the Tombigbee range from sandier, coarse-grained soils on natural levees and ancient sandbars to silts and clays in the more poorly drained areas away from the river. The majority of refuge land is of first bottom type—only a few feet above river level—although some ridges rise approximately 50 feet above mean sea level in the Turkey Creek area. Due to the location of waterfowl-oriented refuges in wetland areas, most of the soils within the refuge are silts and clays, which have fine texture, low permeability and high shrink–swell potential. The surface layer is often hard when dry, friable when moist, and plastic when wet, making moisture content an important consideration when working the soil. Periodic river overflows scour the soil layer and deposit sand and silt.

Hydrology

The Coffeeville Lock and Dam is located two river miles downriver from the refuge on the Tombigbee River. Typically, the Tombigbee River is maintained at a height of around 32 feet above mean sea level. Two creeks of significant size drain into the Tombigbee through the refuge: Okatuppa Creek in the north and Turkey Creek in the south. Their extensive backwaters were created as a result of the Coffeeville impoundment. The entire eastern boundary of the refuge, nearly six miles long, is bordered by the Tennessee-Tombigbee Waterway. This waterway was opened to barge traffic in 1986. Because of its relatively flat profile, the refuge's natural sloughs and cypress lakes hold water through most of the year. Beaver populations only add to this by damming up roughly 86 acres. Moist soil units with functioning water control structures currently occupy about 15 acres.

During spring and much of the winter, more than 90 percent of the refuge is typically under water. Because of the predominantly low elevation of the majority of the refuge—several feet above river level—the refuge's flood regime is highly influenced by the needs of the nearby Coffeeville Lock and Dam (administered by the Corps) and, in turn, barge traffic. In contrast to many other national wildlife refuges managed by the Service, which face a dearth of flooding due to channelization, levee construction, and other human-induced alterations of the historical hydrological regimes, the Choctaw Refuge is subjected to possibly too much flooding, especially insofar as its timing. There have been, and should continue to be, Memoranda of Understanding between the Service and the Corps that enhance communication and cooperation on management issues that affect the refuge.

Water Quality

In 1993, water quality levels were established for five locations at the refuge recognized as prime fisheries for anglers. All were tested for temperature, pH, turbidity, water hardness, organic/inorganic pollutants, dissolved oxygen, Secchi disk, and alkalinity. The sampling confirmed

that the water quality was good. This was further corroborated by fish sampling, in which the fish showed good health and color.

A large amount of water quality data is available for the Tombigbee River downstream of Coffeeville Lock and Dam. The U.S. Geological Survey, in cooperation with the Corps of Engineers, conducts monthly water quality sampling downstream of the dam. The water quality parameters include dissolved oxygen, specific conductance, pH, fecal coliform, nitrogen, phosphate, carbon, calcium, chloride, manganese, dissolved solids, metals, and pesticides. Contaminants personnel at the Service's Ecological Services Field Office in Daphne, Alabama, as well as the U.S. Geological Survey, may be helpful in analyzing the water quality data and looking for trends that may be affecting the refuge's fish and wildlife resources. Consideration of water quality data should be integral in planning the future management of Choctaw National Wildlife Refuge.

As a result of land uses upstream in the watershed, particularly logging and road-building, sedimentation, whether pesticide-laden or not, is a constant source of concern for the refuge. This is particularly so for shallow sloughs and backwaters, which have filled in substantially over the last four decades, losing area and depth, and becoming more susceptible to being choked off by invasive aquatic weeds. Periodic flooding, which serves to flush and revitalize aquatic habitats, also results in soil erosion, compounding the siltation problem. Impacted wetlands, lakes, and waterways not only suffer diminished water quality, but also fill in, resulting in a loss of aquatic habitat.

As with many other refuges in the Southeast, the Service has no ownership interest in the subsurface rights at Choctaw National Wildlife Refuge. As a result, there is little to no control over oil and gas operations. Given the number of pipelines in and around the refuge and barge traffic on the river, there is always the risk of an oil or saltwater spill or seepage (naturally-occurring saltwater is pumped to the surface mixed with oil). A saltwater spill last occurred in 2001. The refuge should continue working to prevent on-site barge-docking stations, rights-of-way for fossil fuels, and oil/gas extraction projects with potential for spills or overflow. Disturbances and alterations to the refuge from such operations, even when executed without calamity, are not conducive to meeting the refuge's goals and purposes.

Oil Wells and Pipelines

As mentioned earlier, the refuge does not own subsurface mineral rights, and therefore cannot prohibit either the exploration for or development of hydrocarbons such as oil and natural gas. However, refuge management can cooperate and negotiate with oil and gas companies to minimize the impacts of their activities on habitat and wildlife.

Choctaw National Wildlife Refuge faces the risk of contaminant impacts from three primary sources related to oil operations: producing wells and pipelines on the refuge; producing wells, storage facilities, and pipelines adjacent to the refuge; and pollutants carried into the refuge from incidents occurring on the Tombigbee River (U.S. Fish and Wildlife Service 1988). Pipelines have the potential for the largest spills, especially where they are above ground and at stream crossings. Choctaw has developed an Oil and Hazardous Substances Contingency Plan to direct the Service's response in the event of oil spills or other contaminant leaks that would affect the refuge. The potential for damage from spills is greatest when the refuge is flooded. So far, no major incidents have occurred.

Plant Communities

Alabama contains nearly 22 million acres of forestland: two-thirds of the state is covered by trees (Auburn University n.d.). Four major forest types occur in the state: pine, pine–hardwood mixture, bottomland hardwood, and upland hardwood. Bottomland hardwoods, the type that predominates at Choctaw National Wildlife Refuge, represent 2.3 million acres or about 10 percent of the state's forests. As mentioned earlier, open water and marsh occupy some 40 percent of the refuge. Virtually the entire remainder, except for those areas that are farmed or maintained as moist soil units, is covered by different types of bottomland forest that overlap in species composition and structure.

The lowest areas throughout the refuge contain cypress and buttonbush. Cypress is complemented, or partially replaced, in a few low areas by swamp tupelo. Other woody species in permanent or semipermanently flooded areas include swamp privet, water elm, black willow, and water locust.

The distribution of bottomland hardwood species across floodplains is primarily a function of the soil moisture gradient in which a couple of feet can be determining. So, at slightly higher elevations green ash and red maple flourish, along with cottonwood, honey locust, sycamore, overcup oak, American elm, and Nuttall oak. Extensive flats support scattered deciduous holly (possum haw) in the midstory, while hardwoods on still higher sites include willow oak, sweet gum, and water oak.

Prior to acquisition by the Corps of Engineers, trees larger than 16 inches in diameter were harvested from what is now the refuge. This resulted in a release of the smaller trees, as evidenced by the preponderance of trees on the refuge between 50 and 70 years old. A timber cruise in the mid-1980s revealed signs, at that time, of some oak regeneration and other saplings.

The Service contracted with the Alabama Natural Heritage Program of The Nature Conservancy to conduct a natural community and rare plant survey of the Choctaw Refuge, which was published in July 2003 (Schotz 2003). This survey identified 14 distinct natural plant associations or communities on the refuge, which are listed in Table 5 and shown in Figure 4. Each of these 14 communities is briefly described.

Upland Mixed Forest

The refuge's upland mixed forest is one of two communities that are mesic, that is, possessing soils with a well-balanced or moderate supply of moisture. Upland mixed forests occur throughout Alabama, but their composition varies across the state from a nearly subtropical forest in the south to a cool temperate flora in the north. As well demonstrated at the Choctaw Refuge, anthropogenic (human-caused) disturbances have added to the natural disturbance regimes, thus further modifying the area's ecological processes. Combinations of species and natural communities that were not present in the refuge landscape during the pre-settlement era are currently being formed. Two upland forest communities are presently recognized on the refuge.

The first association, the upland mixed forest, is also called the *Pinus taeda – Quercus falcata – Quercus alba / Ostrya virginiana / Chasmanthium sessiliflorum* Forest [Loblolly Pine – Southern Red Oak – White Oak / Hop Hornbeam / Longleaf Spikegrass Forest]. This community occupies well-drained sites throughout southern Alabama, typically occurring on upper to mid-slopes. At the Choctaw Refuge, its distribution is essentially confined to a small series of slopes within the southernmost portion of the refuge. The canopy is often characterized by a prominence of loblolly pine (*Pinus taeda*) and various hardwoods, most notably white oak (*Quercus alba*); southern red oak (*Quercus falcata*); sweetgum (*Liquidambar styraciflua*); mockernut hickory (*Carya alba*); and in lesser

abundance, shortleaf pine (*Pinus echinata*); tuliptree (*Liriodendron tulipifera*); beech (*Fagus grandifolia*); and black gum (*Nyssa sylvatica*). The subcanopy and shrub layers generally exhibit a patchy distribution, with shrubs and low-growing trees attaining their greatest abundance on the steepest slopes, where the effects of naturally occurring fire is minimal. Dense thickets of mountain laurel (*Kalmia latifolia*) and a panoply of other fire-intolerant species inhabit these areas. Where fire becomes more pervasive upon the landscape, the understory is diminished in terms of spatial coverage and species diversity.

Successional Pine – Oak Forest

The successional pine – oak forest is the other mesic community on the refuge. It is also called the *Pinus taeda – Quercus nigra* Forest [Loblolly Pine – Water Oak Forest]. This community is codominated by loblolly pine, water oak (*Quercus nigra*), and sweetgum, resulting from past disturbance (such as agricultural or other land clearings) followed by forest succession. The understory is highly variable, depending on age and history; and is characterized by a mature canopy of the above-mentioned tree species and a relatively open understory of red maple (*Acer rubrum*), deciduous holly (*Ilex decidua*), winged elm (*Ulmus alata*), water oak, and sweetgum. The herb layer is sparse, with Christmas fern (*Polystichum acrostichoides*), ebony spleenwort (*Asplenium platyneuron*), partridgeberry (*Mitchella repens*), and various sedges (*Carex* spp.) appearing most frequent. Muscadine grape (*Vitis rotundifolia*) and Japanese honeysuckle (*Lonicera japonica*) are common vines.

East Gulf Coast Coastal Plain Acidic Loam Beech – Magnolia Forest

This community is also known as the *Fagus grandifolia – Magnolia grandiflora – Pinus glabra – (Magnolia macrophylla) / (Illicium floridanum) / Hexastylis arifolia* Forest. At the Choctaw Refuge, it is mainly restricted to the natural levee that parallels the west side of the Tombigbee River. Elevated no more than five feet above adjacent wetland areas, the vegetation marks a striking contrast in relation to the hardwood-dominated associations of more hydric systems. Undoubtedly, the most pervasive trademark of the levee forest assemblage is the presence of loblolly and spruce pines (*Pinus taeda* and *P. glabra*, respectively). Other species, in decreasing order, are cherrybark oak (*Quercus pagoda*); water oak; sweetgum; tuliptree; southern magnolia (*Magnolia grandiflora*); beech; and pignut hickory (*Carya glabra*). The understory contains not only smaller specimens of the foregoing canopy species, but also an assortment of low-growing trees and shrubs such as flowering dogwood (*Cornus florida*); American hornbeam; two-wing silverbell (*Halesia diptera*); sassafras (*Sassafras albidum*); American holly (*Ilex opaca*); youpon (*I. vomitoria*); deciduous holly (*I. decidua*); winged elm (*Ulmus alata*); beautyberry (*Callicarpa americana*); and Elliott's blueberry (*Vaccinium elliottii*). The herbaceous component is generally sparse and of low diversity.

This hydric association and the several that follow are generally considered the bottomlands of floodplain forests. Floodplain forests are found wherever streams or rivers flood at least occasionally beyond their channels. In the southeastern United States, these forests are broadly classified into three general categories: bottomland forests, floodplain forests, and deepwater alluvial swamps, each being defined by the frequency and timing of annual flooding. Floodplain ecosystems are highly variable in size, ranging from broad alluvial valleys several miles across to more narrow strips of streambank vegetation. At the Choctaw Refuge, four of these forest associations are recognized and currently comprise a vast proportion of the refuge landscape.

As noted in Chapter 1, southern floodplain forests have suffered some of the most rapid reductions in size and changes in vegetative composition of nearly any other forest biome in the United States. Therefore, they are of critical conservation concern. Many have been and continue to be converted to farmlands and industrial parks; they are also being modified by urban and suburban expansion. Still other bottomlands are managed for timber production or as recreational areas in ways that reduce their value as natural wetland habitats.

Table 5. Natural communities identified at Choctaw National Wildlife Refuge

Scientific Name	Common Name	Global Rank	State Rank	No. of EORs
Pinus taeda – Quercus falcata – Quercus alba / Ostrya virginiana / Chasmanthium sessiliflorum Forest	Upland Mixed Forest	G4G5	S2	0
Pinus taeda – Quercus nigra Forest	Successional Pine – Oak Forest	G5	S5	0
Fagus grandifolia – Magnolia grandiflora – Pinus glabra (*Magnolia macrophylla*) / (*Illicium floridanum*) / *Hexastylis arifolia* Forest	East Gulf Coastal Plain Acidic Loam Beech – Magnolia Forest	G3	S2	1
Liquidambar styraciflua – Quercus pagoda – Carya spp. / *Carpinus caroliniana / Carex* spp. Forest	Floodplain Forest	G3G4	S2	1
Quercus texana – Quercus lyrata – Quercus phellos Forest	Bottomland Oak Forest	G3G4	S1	0
Fraxinus pennsylvanica – Ulmus americana / Carpinus caroliniana / Boehmeria cylindrica Forest	Bottomland Hardwood Forest	G4?	S2	0
Successional Field / Oil Well Field	Successional Field	G5	S5	0
Taxodium distichum / Lemna minor Forest	Cypress Swamp	G4G5	S4	0
Taxodium distichum – Nyssa aquatica – Acer rubrum / Itea virginica Forest	Cypress – Gum Swamp	G4?	S2	2
Cephalanthus occidentalis / Carex spp. – *Lemna* spp. Southern Shrubland	Southern Buttonbush Pond	G4	S2	0
Planera aquatica Forest	Planertree Floodplain Swamp Forest	G4?	S2	0
Salix nigra Temporary Flooded Shrubland	Black Willow Swamp	G5	S3	0
Zizaniopsis milliacea Coastal Plain Slough Herbaceous Vegetation	Southern Wild Rice Slough Marsh	G4?	S2	0
Nelumbo lutea Herbaceous Vegetation	American Lotus Aquatic Wetland	G5	S5	0
Total Number of Natural Communities			**14**	
Total Number of EORs			**4**	

[An element is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, sinkhole, or other ecological feature. An Element Occurrence (EO) represents the location of an element and is the environment which sustains a species' population or an example of a natural community. The Element Occurrence Record (EOR) is the computerized record that contains the biological and locational information regarding a specific EO.]

Definition of Heritage Ranks

The Alabama Natural Heritage Program uses the Heritage ranking system developed by The Nature Conservancy. Each species is assigned two ranks; one representing its rangewide or global status (G rank), and one representing its status in the state (S rank). Species with a rank of 1 are most critically imperiled; those with a rank of 5 are most secure.

Global Ranking System

G1 Critically imperiled globally (5 or fewer occurrences)

G2 Imperiled globally (6 to 20 occurrences).

G3 Either very rare and local throughout its range or found locally in a restricted range (21 to 100 occurrences).

G4 Apparently secure globally.

G5 Demonstrably secure globally.

GH Of historical occurrence throughout its range.

GU Possibly in peril range-wide but status uncertain.

GX Believed to be extinct throughout range.

G? Not ranked to date.

G#T# Rank for subspecies or varieties where # is equal to 1, 2, 3, 4, 5, H, U, X, or ?.

HYB Hybrid

Special state ranking for migrants:

SZ Not of conservation concern in Alabama because species in this category are so widely and unreliably distributed during migration or in winter that no small set of sites could be set aside with the hope of significantly furthering their conservation. A rank of SZN indicates the species does not breed in Alabama. Species that have resident breeding populations that are augmented in winter by non-breeding migrants may have dual ranks, one each for the breeding (B) and non-breeding (N) components.

SB Regularly occurring, migratory and present only during the breeding season. A rank of S3B indicates a species uncommon during the breeding season (spring/summer) in Alabama.

SN Regularly occurring, usually migratory and typically non-breeding species in Alabama; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in Alabama but pass through twice a year or may remain in winter. A rank of S2B,S5N indicated a rare breeder but a common winter resident.

State Ranking System

S1 Critically imperiled in Alabama because of extreme rarity (5 or fewer occurrences of very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from Alabama.

S2 Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from Alabama.

S3 Rare or uncommon in Alabama (on the order of 21 to 100 occurrences).

S4 Apparently secure in Alabama, with many occurrences.

S5 Demonstrably secure in Alabama and essentially "ineradicable" under present conditions.

SA Accidental in Alabama, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded.

SE An exotic established in Alabama.

SH Of historical occurrence, perhaps not verified in the past 20 years, and suspected to be still extant.

SR Reported, but without persuasive documentation which would provide a basis for either accepting or rejecting the report (e.g. misidentified specimen). Some of these are very recent discoveries for which the program has not yet received first-hand information; others are old, obscure reports that are hard to dismiss because the habitat is now destroyed.

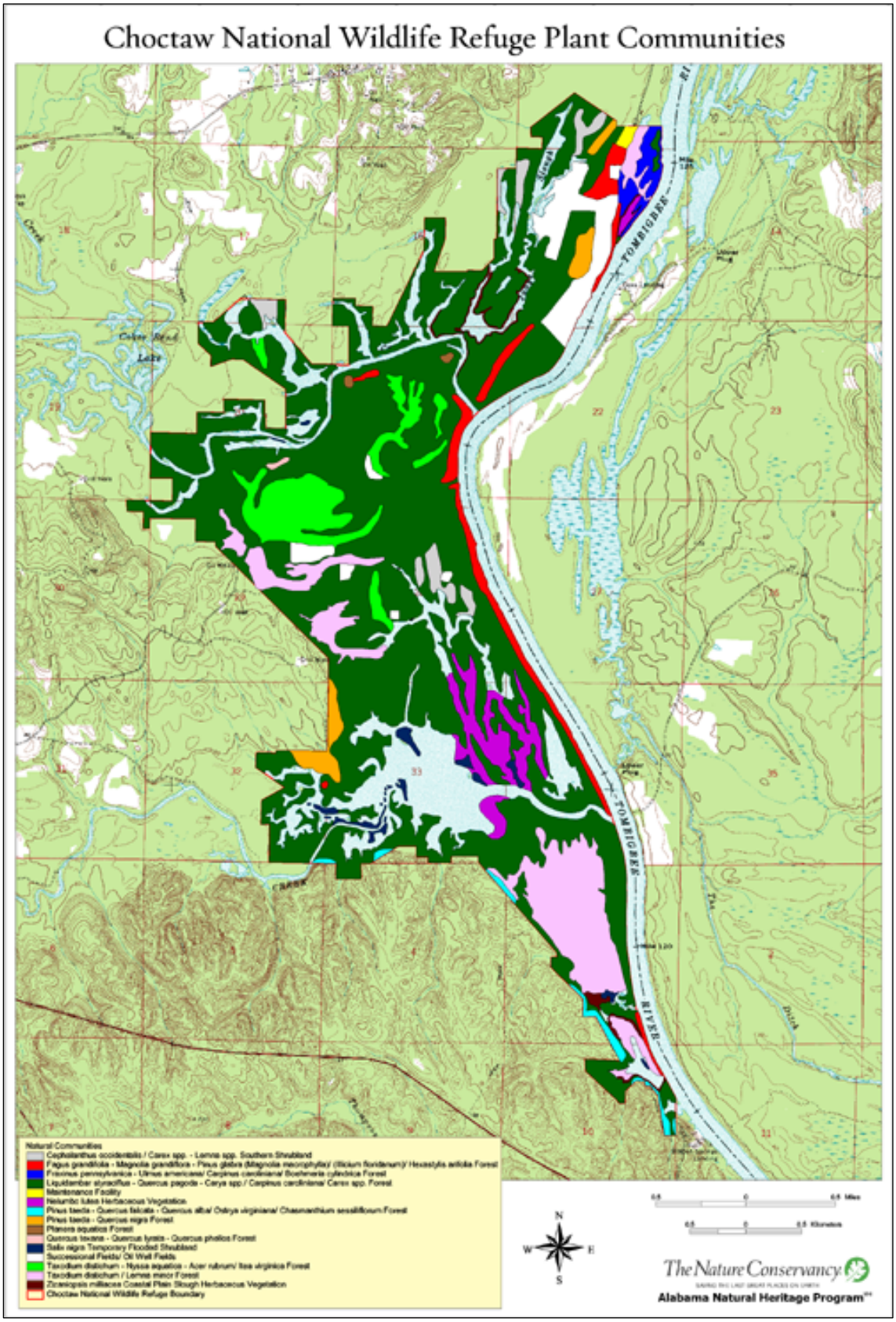
SRF Reported in error (falsely), but this error persisted in the literature.

SU Possibly in peril in Alabama but status uncertain; more information needed.

SX Apparently extirpated from Alabama.

S? Not ranked to date.

Figure 4. Plant communities at Choctaw National Wildlife Refuge



Floodplain Forest

The floodplain forest is also known as the *Liquidambar styraciflua – Quercus pagoda – Carya* spp. / *Carpinus caroliniana / Carex* spp. Forest [Sweetgum – Cherrybark Oak – Hickory species / American Hornbeam / Sedge species Forest]. This association comprises a large proportion of the Choctaw Refuge and is represented by a codominance of cherrybark oak (*Quercus pagoda*), willow oak (*Q. phellos*), green ash (*Fraxinus pennsylvanica*), and sweetgum in the canopy. More widely distributed, but seldom absent from the canopy, is a suite of secondary species such as bitternut hickory (*Carya cordiformis*), water oak, swamp chestnut oak (*Quercus michauxii*), American elm (*Ulmus americana*), and sugarberry (*Celtis laevigata*). Of particular interest is the presence of shellbark hickory (*Carya laciniosa*), pecan (*C. illinoensis*), and Nuttall's oak (*Quercus texana*), the distribution of which in Alabama is sparse and sporadic, with only occasional specimens having been observed at Choctaw. This association's understory is open and park-like, containing saplings of the foregoing canopy associates, as well as a variety of small trees and shrubs such as American hornbeam, deciduous holly, green haw (*Crataegus viridis*), red mulberry (*Morus rubra*), and dwarf palmetto (*Sabal minor*).

Bottomland Oak Forest

This hydric association is also called the *Quercus texana – Quercus lyrata – Quercus phellos* Forest. This association typically occurs on shallow, narrowly defined depressions that are scattered throughout the forested bottomlands along the Tombigbee River. A closed canopy forest, it is characterized by a prominence of Nuttall's oak, overcup oak (*Quercus lyrata*), and willow oak, with green ash and sugarberry (*Celtis laevigata*) occurring less frequently and therefore of secondary importance. The shrub and herb layers are relatively sparse, often characterized by a low diversity of plant life.

Bottomland Hardwood Forest

At Choctaw National Wildlife Refuge, this association is confined to the low peninsular region at the junction of Hackberry Lake and the Tombigbee River. This is a temporarily flooded forest association dominated by green ash in the canopy. Other canopy associates include, in decreasing order of abundance, silver maple (*Acer saccharinum*); box-elder (*A. negundo*); American elm (*Ulmus americana*); sycamore (*Platanus occidentalis*); black willow (*Salix nigra*); and sugarberry (*Celtis laevigata*). Resurrection fern (*Pleopeltis polypodioides* var. *michauxiana*) and Spanish moss (*Tillandsia usneoides*) are epiphytic on the branches of some trees (that is, growing on the branches of the trees themselves and not in soil). Assorted vines are also in evidence.

Successional Field

Successional fields are a relatively short-lived association, the result of former land use practices in which the forest was eliminated, and then permitted to reestablish itself. Fields are the initial phase in the progression of vegetational succession following the cessation of regular land use or intervention (e.g., plowing, discing, and harvesting). Over the course of time these sites will gradually transform into a climax forest, probably the ***Liquidambar styraciflua*** – ***Quercus pagoda*** – ***Carya*** spp. / ***Carpinus caroliniana / Carex*** spp. Forest, a community that prevails throughout much of the surrounding area. At the Choctaw Refuge, this vegetation type includes oil well fields. It is represented by the earliest levels of succession: herb-dominated fields occasionally accented by a series of low-growing trees and shrubs. Vegetation is characterized by a prominence of weedy herbaceous species, such as bahia grass (***Paspalum notatum***); vasey grass (***P. urvillei***); tall fescue (***Festuca elatior***); Brazilian vervain (***Verbena brasiliensis***); dog fennel (***Eupatorium capillifolium***); and horseweed (***Conyza canadensis***).

Roadsides are similar floristically and structurally to successional fields, but typically support a greater plant diversity. In fact, roadsides are among the most interesting plant communities at the Choctaw Refuge, as they represent a conglomerate of floristic elements of diverse origins. The high disturbance associated with roadsides also provides suitable habitat for a diverse array of native and exotic weeds. Examples of common native roadside weeds include bitterweed (***Helenium amarum***); blackberries (***Rubus*** spp.); dog fennel (***Eupatorium capillifolium***); horseweed (***Conyza canadensis***); and Venus looking-glass (***Triodanus perfoliata*** var. ***biflora***). Frequently found exotics include wild carrot (***Daucus carota***); dead nettles (***Lamium*** spp.); bahia grass (***Paspalum notatum***); Brazilian vervain (***Verbena brasiliensis***); white clover (***Trifolium repens***); Japanese honeysuckle (***Lonicera japonica***); and beefsteak plant (***Perilla frutescens***).

Cypress Swamp

A predominance of bald cypress (***Taxodium distichum***) distinguishes this association. The presence of this species among the swamp lakes at the refuge is highly variable, with a range of canopy coverage extending from near 100 percent in the majority of examples to less than 30 percent in some deep water occurrences. Water tupelo (***Nyssa aquatica***), black willow (***Salix nigra***), buttonbush (***Cephalanthus occidentalis***), red maple (***Acer rubrum*** var. ***drummondii***), and Virginia willow (***Itea virginica***) occur as understory associates. The herbaceous component is represented by a rich diversity of shallow water emergents, floating-leaved aquatics, and other wetland species, often attaining the greatest development where canopy cover is sparse. The most open-canopied examples contain large colonies of American lotus (***Nelumbo lutea***), which, along with bur-marigold (***Bidens laevis***), commonly serves as the dominant herb. Adding a classical southern look are thick curtains of Spanish moss.

Cypress – Gum Swamp

This is also called the Bald Cypress – Water Tupelo – Red Maple / Virginia Willow Forest. It is similar to the foregoing association, but is easily distinguished by the codominance of water tupelo or black gum and bald cypress in the canopy. The subcanopy and shrub layers are sparse to moderate, containing a low diversity of species. Red maple, black willow, buttonbush, and Virginia willow are also scattered throughout the understory. An impressive array of herbs inhabits the shallow water and mucky soils of the encompassing shoreline.

Southern Buttonbush Pond

Widespread throughout the southeastern United States, this shrubland assemblage typically occurs in oxbow lakes, backwater sloughs, beaver ponds, and shallow depressions associated with bottomlands and floodplains. At the Choctaw Refuge, this association is inundated most of the year, emerging only during occasions of prolonged drought. The dominant plant is buttonbush, often to the exclusion of other woody species. Black willow (***Salix nigra***) may also be present, but usually accounts for less than five percent of the total canopy cover. Principal herb species include the spotted water pepper (***Polygonum punctatum***); bur-marigold (***Bidens laevis***); lizard's-tail (***Saururus cernuus***); maidencane (***Panicum hemitomum***); halberd-leaved rose-mallow (***Hibiscus militaris***); broad-leaved arrowhead (***Sagittaria latifolia***); Cuban sedge (***Scirpus cubensis***); and various duckweeds (***Lemna*** spp.)

Plannertree Floodplain Swamp Forest

At the Choctaw Refuge, this community is represented by two small circular-shaped occurrences on the south side of Okatuppa Creek. Both examples are dominated by nearly monospecific stands of

planertree (***Planera aquatica***) with scattered specimens of green ash, sweetgum, and buttonbush. Herbs are relatively sparse and of low diversity, with lizard's-tail serving as the principal species.

Black Willow Swamp

This community is composed of young or frequently disturbed thickets of black willow that inhabit the shallow water of the backwaters of the Tombigbee River. Occurrences are moderately vegetated in the understory with an assortment of shrubs, vines, and herbs. Typical species include buttonbush; eardrop-vine (***Brunnichia ovata***); sugarcane plumegrass (***Saccharum giganteum***); broad-leaved arrowhead (***Sagittaria latifolia***); helberd-leaved rose-mallow (***Hibiscus militaris***); water pepper (***Polygonum hydropiperoides***); wool grass (***Scirpus cyperinus***); sallow sedge (***Carex lurida***); and southern wild rice (***Zizaniopsis milliacea***).

Southern Wild Rice Slough Marsh

This widely distributed association occurs at Choctaw Refuge along the margins of backwater sloughs. Characterized by a prominence of southern wild rice, this vegetation type is nearly monospecific, containing only a small number of affiliated herbs, including broad-leaved arrowhead, catchfly grass (***Leersia lenticularis***), beakrush (***Rhynchospora corniculata***), and water pepper. Alligator-weed (***Alternanthera philoxeroides***), an invasive species from South America, has also invaded some areas.

American Lotus Aquatic Wetland

This association is primarily restricted to the backwaters of the Tombigbee River, specifically Hackberry Lake. Stands are essentially monospecific, often covering large areas. Other floating-leaved aquatics are also present, such as yellow pond lily (***Nuphur lutea*** ssp. ***advena***), duckweed, mosquito fern (***Azolla caroliniana***), and the exotic water hyacinth (***Eichhornia crassipes***) and hydrilla (***Hydrilla verticillata***). Emergent species include pickerel-weed (***Pontederia cordata***), broad-leaved arrowhead, and water pepper.

Agricultural Fields and other Areas

The agricultural fields on the refuge are cultivated with corn, clover, milo, millet, and sunflowers. Crop acreage is designated only to meet wildlife objectives. Open areas not being farmed support a lush abundance of dewberries, cockleburs, Johnson grass, smartweeds, sedges, and fall panicum. In addition, the abandoned well sites from oil and gas exploration and extraction on the refuge have either been restored to bottomland hardwoods or maintained as open field areas planted in winter grasses.

Forest Resources Management

Approximately 2,265 acres of the Choctaw Refuge's 4,218 acres are forested. Prior to the purchase of the lands by the Corps of Engineers, the former owners were allowed to remove timber.

The refuge has a Forest Management Plan dating from 1986, but it has never been fully implemented due to limited funds and staff. A one percent forest management cruise was conducted for the first time in January of 1986 as the plan was under development. The cruise showed that mid-aged red oak species with a basal area of approximately 35 square feet per acre were fairly evenly distributed over the refuge. Sweetgum, with a basal area of approximately 20 square feet per acre, was the second most common species with diameters ranging from 4 to 24 inches. Ironwood (American hornbeam) was common in most areas, and almost nothing was growing on the shaded forest floor.

The Forest Management Plan identified wildlife and tree species to be favored by management. A number of species of ducks can use the refuge's forested areas for food, including the wood duck; mallard; wigeon; black duck; gadwall; pintail; green-winged and blue-winged teal; shoveler; and hooded and red-breasted mergansers. The most important group of trees for waterfowl food production is the red oaks, including water oak, willow oak, cherrybark oak, and Nuttall's oak; while shumard oak and laurel oak are found occasionally.

Even though small oak seedlings were found, they soon died from lack of sunlight. From the first harvest in 1987 to the last forest improvement in 1992, the plans involved marking leave trees; leaving approximately 50 square feet per acre, and removing all other items down to zero inch diameter. Approximately 90 percent of the trees that were marked to remain are oaks, depending on the area. Other tree species that were left include sweetgum, cypress, American beech, hickory, blackgum, green ash, elm, and red mulberry. This treatment kept most of the mast-producers in place, as well as the existing den trees, and removed most of the sweetgums and ironwoods causing the shade.

In recent years, the refuge's forest management has included observing the effects of the forest improvements for wildlife done in previous years and planting tree seedlings. Inspections of the areas that received treatments to provide sunlight to the forest floor continue to show that they have bountiful herbaceous plants, sweetgum seedlings, and lots of briars and vines which are providing browse, cover, and nesting areas. However, the oak seedlings, which were to have been generated from natural acorn reproduction, do not appear to survive in abundance beyond the second or third year. At this time, refuge management believes that because shade is not a limiting factor in these areas, the likely culprit is late spring floods, which appear to be taking a toll on oak survival and recruitment.

The Choctaw Refuge also has a Fire Management Plan, which was approved in 2001 (Choctaw National Wildlife Refuge 2001). In the four-decade history of the refuge, no unwanted wildland fire (formerly called "wildfire") has ever been recorded. A single prescribed fire was conducted in the early 1980s, but the results were unsatisfactory and this management technique has not been used since.

Moist Soil Management

Moist soil management refers to the management of land to provide moist soil conditions during the growing season to promote the natural production of beneficial plants. Seeds produced by these plants often attract and concentrate waterfowl and other wetland wildlife species. The decomposing vegetative parts of moist soil plants also provide substrate for invertebrates, which are critical food for many wetland wildlife and fish.

Choctaw National Wildlife Refuge has four small moist soil impoundments on the north end, which total 15 acres. Generally speaking, not discing the units results in better natural crops of moist soil vegetation in these nutrient-rich soils. When water conditions are right, the variety of plants includes smartweed (***Polygonum*** sp.); panic grass (***Panicum*** sp.); pigweed (***Amaranths*** sp.); sedges (***Carex*** sp.); foxtails (***Setaria*** sp.); common millet (***Echinochloa*** sp.); spikerush (***Eleochoris*** sp.); and sprangletop (***Leptochloa*** sp.).

When the above vegetation does not emerge naturally, for utilization by ducks, the units are then disced. Usually, early discing promotes the dominance of alligatorweed (***Alternanthera philoxeroides***) and primrose (***Ludwigia*** sp.), both exotics.

Croplands

Limited force-account farming (i.e., farming conducted by refuge employees) is conducted on about 40 acres at the Choctaw Refuge to provide supplemental food for wildlife and waterfowl. Three objectives are identified in the refuge's Cropland Management Plan, approved in 1994:

1. To supplement naturally occurring food supplies in support of wildlife populations at levels set in refuge, flyway, regional, or national objectives;
2. To prevent encroachment and establishment of undesirable vegetation and to aid the establishment of more permanent natural cover; and
3. To prevent depredations of private croplands.

Crops include millet, Japanese millet, sorghum, buckwheat, rye, rye grass, wheat, and clover (Choctaw National Wildlife Refuge 2002a). There is some use of fertilizers and herbicides.

Fauna

Mammals

Mammals occurring on the refuge represent many of the species extant in the Central Gulf Coast region as a whole. Large mammals include the abundant white-tailed deer and feral hogs. It is imperative that the exploding population of feral hogs be checked, as this invasive nonnative competes directly with native species for resources. Swine also depredate the nests of ground-nesting birds, many species of reptiles and amphibians, and young birds and mammals. In addition, they cause considerable damage to dikes, roads, and other refuge structures.

Medium-sized mammals include the bobcat, opossum, armadillo, cottontail and swamp rabbit, beaver, nutria, grey squirrel, coyote, and raccoon. The nutria was introduced from South America and is a noteworthy invasive species. Beavers, a native species, have a tremendous potential impact on bottomland hardwoods. They interfere with water control activities by plugging culverts, ditches, and water control structures. Problems associated with the impounding of water by beaver represent a major threat to the hardwoods within the refuge.

The armadillo extended its range into this part of Alabama some time during the latter half of the 20th century. Its impact here has not been investigated. Coyotes are also a recent arrival, with first sightings recorded in the 1980s. Their presence is thought to be responsible, among other things, for the scarcity or absence of foxes. Nutria, like feral swine, tend to upset the balance among the native aquatic mammals, competing with them for food and space while simultaneously destroying habitat. Raccoons are abundant and prone to overpopulation.

Small mammals have not been surveyed on the refuge, but potentially include shrews, bats, chipmunks, squirrels, new world rats and mice, voles, old world rats and mice, weasels, rabbits, and mink.

Birds

Established primarily as a wintering area for migrating birds, especially waterfowl, the refuge winters a variety of ducks, including mallard, wigeon, teal, shoveler, and ringneck. The wood duck is a year-round resident, raising its young in the many nesting boxes placed throughout the refuge. The nesting boxes are similarly used by hooded mergansers. Upland game birds at the Choctaw Refuge include eastern wild turkey and bobwhite quail.

The abundance of shallow water and vegetation provides excellent habitat for marsh and wading birds. Herons, egrets, belted kingfisher, white ibis, purple gallinule, and anhinga are seen in large numbers during spring and summer. Endangered wood storks congregate during summer on the Blue Fields, which are flooded by the staff and stocked with bluegill.

Laughing gulls and Caspian terns are sometimes observed flying along the Tombigbee River. Other shorebirds and allied species attracted to moist soil areas next to the farm unit are the lesser yellowleg, spotted sandpiper, and common snipe, along with the killdeer and the rarely spotted American white pelican.

Habitat for neotropical migratory birds, of which there are over 100 species documented at Choctaw, is found scattered throughout the refuge. The woods echo with the sound of their activities as they stop to rest and feed on the bottomlands.

The most abundant raptor on the refuge is probably the red-shouldered hawk, but Mississippi and swallow-tailed kites are also commonly sighted as they search the fields for prey. The threatened American bald eagle can be seen on the refuge in winter and also in spring, when it nests. Bald eagles tend to arrive and leave with the wintering waterfowl.

Woodcock trends in the United States have been declining annually for the last 15 years, only in part due to hunting. The American Woodcock Management Plan initiated in the 1990s, to which the Choctaw Refuge is a contributor, points out the need for improved breeding, migration, and wintering habitat to enhance population growth and survival. Much of the woodcock's decline is thought to be caused by land use changes and the maturing of forest habitats, resulting in less early successional shrub/scrub habitats preferred by the species. The formation of such habitat, fortunately, is incidental (in the short run) to reforestation, old field succession, and other management actions undertaken to benefit priority forest interior-nesting land birds (e.g., Swainson's warbler, cerulean warbler) and other wildlife on the refuge.

Reptiles

No reptile survey has been conducted on the refuge. However, the refuge's various habitats and favorable conditions should support abundant reptile populations and species diversity. The most prominent reptile on the refuge is the American alligator, listed as endangered in 1967, but whose numbers have rebounded dramatically throughout the Southeast in recent decades. As a result of this recovery, the alligator was delisted in 1987 (U.S. Fish and Wildlife Service 1995). Now the species is listed as "threatened by similarity of appearance" to the American crocodile. Providing habitat and a sanctuary for alligators was an early justification for Choctaw National Wildlife Refuge.

In support of the Partners in Amphibian and Reptile Conservation (PARC), refuge surveys for reptiles—primarily turtles, lizards, and snakes—are anticipated to be conducted by 2005.

Amphibians

To date the refuge has not conducted any surveys for frogs and amphibians. In support of PARC, a basic amphibian survey, calling frog surveys, and searches for toad and salamander breeding sites are anticipated to be conducted by 2005. These surveys will establish baseline information for amphibians at the refuge and will be useful for future comparisons. The North American Amphibian Monitoring Program, developed by the U.S. Geological Survey to monitor amphibians, should be consulted for guidance.

Fish

The Tombigbee River is prone to severe seasonal flooding, which typically inundates nearly the entire refuge. Most of the refuge's waters are contiguous with the Tombigbee River and therefore constitute a large, open system. This dramatically affects fish communities and preempts extensive fishery management, including stocking.

The best fisheries on the refuge include species popular with anglers, like crappie, bream, largemouth bass, catfish, and redear sunfish. Sunfish are also favored by wading birds like the wood stork, which sometimes uses the scenic Hackberry Lake as a rookery. An electrofishing survey conducted on Hackberry Lake in 1993 additionally revealed bluegill, chain pickerel, gizzard shad, quillback, spotted sucker, and spotted gar. Another electrofishing survey on Judy Slough detected spotted sucker, blacktail redhorse, freshwater drum, striped mullet, and bowfin, in addition to the species uncovered in Hackberry Lake. Near the lake substrate and in other aquatic areas of the refuge that seldom receive a flushing flow from the Tombigbee River, fish can freely migrate out into the river during flood periods, if low dissolved oxygen becomes a limiting factor.

Exotic and Invasive Species

Invasive, exotic (nonnative) species have caused irreparable damage to natural communities throughout the Southeast. Japanese climbing-fern (***Lygodium japonicum***), mimosa (***Albizia julibrissin***), Japanese honeysuckle (***Lonicera japonica***), water hyacinth (***Eichhornia crassipes***), and alligator-weed (***Alternanthera philoxeroides***) are five invasive plants that have become well established in several locations on the refuge (Schotz 2003). These species are capable of colonizing large areas, generally in full sunlight, throughout warmer regions of the world. Japanese honeysuckle was first introduced during Colonial times to the Americas at Long Island, New York. Since then, the popularity of this species in gardens has enabled it to spread quickly throughout much of the eastern United States, displacing desirable native vegetation.

Also firmly established in waterways of the refuge is water hyacinth, a species first introduced from South America in 1884. Since then, this floating herb has become widely naturalized in the Southeast, often forming monotypes across large areas. The widespread dispersal of the above-mentioned and other exotic species have been primarily attributed to highway maintenance and construction, horticultural purposes, and the enhancement of wildlife habitat. The illegal and careless disposal of yard trash has also aided the spread of these and other exotic species. Although these taxa were not commonly observed within high quality natural areas, they should be considered a threat to the ecological integrity of natural communities at Choctaw National Wildlife Refuge. Table 6 lists some of the exotic plants observed on the refuge, based on a 2002–2003 survey conducted by The Nature Conservancy's Alabama Natural Heritage Program.

Monitoring and treatment of existing infestations, and preventing the encroachment of new populations, remain an important component of land management throughout Choctaw National Wildlife Refuge. Education of land managers about problems associated with exotic pests, coupled with the use of native species for improving wildlife habitat, may be beneficial in this effort. If nonnative cultivars must be used, then invasive species should be avoided. Many invasive exotic plants are sold in nurseries, despite their known destructive impacts on native vegetation.

In addition, four species of aquatic pest plants infest refuge waters: the American lotus, hydrilla, water hyacinth, and alligator weed. Total eradication of these species is neither feasible nor desirable, but partial control can be achieved and is desirable.

American lotus (a native species) provides excellent wood duck brood habitat with the right combination of cover and open water. The objective is to maintain approximately 75 percent cover and 25 percent open water where possible. Presently, this plant covers 85–90 percent of the surface area of many of the wetland sites by late summer.

Hydrilla, a submersed perennial herb that originated in the Indian subcontinent, infests much of the southeastern U.S. and California. Once established, this aggressive invader disrupts the aquatic ecosystem in many ways. Spreading across shallower zones and forming thick mats in surface waters, it blocks sunlight penetration to native plants below and effectively displaces beneficial native vegetation. Among other impacts, infestations of hydrilla commonly obstruct boating and fishing in lakes and rivers (U.S. Geological Survey 2003), two effects observed at the Choctaw Refuge.

The water hyacinth is a native of South America, but is now naturalized in much of the southern United States (Aquaplant 2004). It is an aggressive invader and can form thick mats on the surface of infected waters. If these mats cover the entire surface of a water body, they can cause oxygen depletion and fish kills. While water hyacinth has no direct food value for wildlife, submerged portions of all aquatic plants provide habitats for many micro and macro invertebrates. These aquatic invertebrates in turn are ingested by fish and other wildlife species (e.g., amphibians, reptiles, and ducks). After the aquatic plants die, their decomposition by bacteria and fungi provides food (called detritus) for many aquatic invertebrates. Nevertheless, from an overall perspective, the water hyacinth is an aggressive pest that needs to be controlled at the Choctaw Refuge, as it is elsewhere.

Alligator weed, introduced from South America, has become a serious pest in southern North America (Mississippi State University Extension Service 2004). It currently appears to be the ultimate culprit to control at Choctaw National Wildlife Refuge. This emergent plant exists on almost all the water bodies, as well as the farm units and moist soil areas. It grows as a free-floating mat of interwoven plants in six feet of water or sprouts from root stock on high ground.

The refuge staff works in close cooperation with the Corps of Engineers and Alabama Department of Conservation and Natural Resources to control the pest plants in the Coffeeville Reservoir through both chemical and biological means. Successful operations provide additional open water and allow for increased recreational use of the lakes (fishing and bird watching), as well as creating additional wood duck brood-rearing habitat. Biological control of alligator weed has been attempted for many years at the refuge by stocking alligator flea beetles, when they were available from the Corps of Engineers' Aquatic Plant Control Operations Support Center in Jacksonville, Florida.

Wildlife Inventory

The refuge has a Wildlife Inventory Plan that describes inventory procedures for alligator number counts; wood duck summer population and production surveys; population counts of ducks and coots; population and production surveys of water birds; and population size estimates of mourning doves, upland game birds, white-tailed deer, and songbirds. Staffing and budgetary constraints have impeded the full implementation of this plan.

Table 6. Exotic plant species observed at the Choctaw Refuge in 2002–2003

Scientific Name	Common Name	Degree of Severity*
Albizia julibrissin	Mimosa	2
Alternanthera philoxeroides	Alligator-weed	1
Daucus carota	Wild carrot	3
Eichhornia crassipes	Water hyacinth	1
Hydrilla verticillata	Hydrilla	2
Imperata cylindrica	Cogon grass	1
Lamium amplexicaule	Purple dead-nettle	3
Lonicera japonica	Japanese honeysuckle	1
Lygodium japonicum	Japanese climbing fern	2
Microstegium vimineum	Nepal grass	3
Paspalum notatum	Bahia grass	2
Paspalum urvillei	Vasey grass	3
Perilla frutescens	Beefsteak plant	3
Quercus acutissima	Sawtooth oak	3
Salvinia minima	Water spangles	2
Tradiaca sebifera	Chinese tallow	2

* Category 1 = Species that have invaded and disrupted native plant communities in Choctaw NWR.
Category 2 = Species that have shown a potential to invade and disrupt native plant communities, but pose no immediate threats in Choctaw NWR.
Category 3 = Species that have persisted around old homesites and have no or minimal potential to invade native plant communities.

REFUGE ADMINISTRATION

Choctaw National Wildlife Refuge has a total staff of four, including a Refuge Manager (GS–12), Office Assistant (GS–7), and two equipment operators (WG–9). The refuge's annual budget is about $256,000. The refuge headquarters is located in Jackson, Alabama, about a 45-minute drive to the south. Within the refuge is a maintenance office, workshop, and storage yard. The refuge does not have a visitor center; the headquarters office in Jackson serves as a visitor contact station.

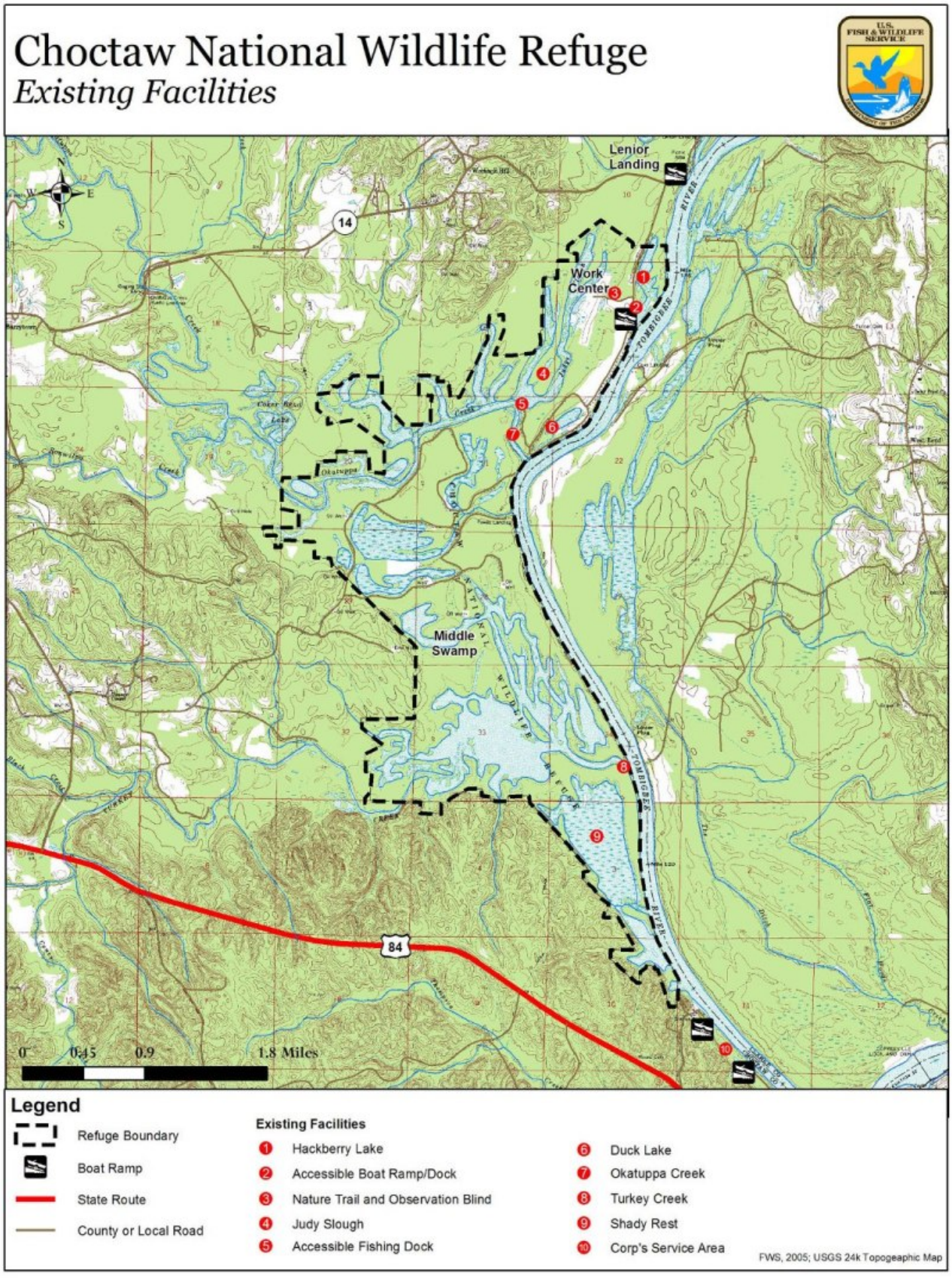
EDUCATION AND VISITOR SERVICES

All six priority public use activities cited in the National Wildlife Refuge System Improvement Act of 1997 are available on the refuge. These are hunting, fishing, wildlife observation and photography, interpretive tours, and environmental education. Despite the fact that much of the refuge is accessible only by boat, public use activities enjoy high participation. Of the three sections of the refuge, only the northernmost is accessible by land vehicle. The existing visitor use facilities are shown on Figure 5.

Fishing

The Choctaw Refuge has a Fishery Management Plan, approved in 1982. Its goal is "to provide and maintain a productive sport fishery within Service guidelines for public use." In pursuing this goal, the refuge partners closely with the Corps and the Alabama Division of Wildlife and Freshwater Fisheries. Gill net surveys and electroshocking surveys have been conducted over the years to inventory the refuge's

Figure 5. Existing visitor use facilities at Choctaw National Wildlife Refuge



fish populations. Much of the effort at controlling noxious aquatic plants is aimed at helping the fishery, both by conserving fish habitat and populations and by maintaining access for boaters and anglers to waterways that would otherwise be clogged by dense mats of impenetrable vegetation.

Choctaw National Wildlife Refuge offers many good recreational fishing opportunities. Fishing is by far the most popular public use activity on the refuge. A boat ramp is provided on Okatuppa Creek. The refuge supports some commercial fishing, as well—for carp, buffalo, shad, and catfish—through permit, two of which were issued in 2003. A universally accessible fishing pier was constructed adjacent to some high quality fish habitat in Judy Slough, a backwater area off Okatuppa Creek.

Approximately 21,000 people fish on the refuge annually. A two-lane boat launching area located across from the Womack Hill Work Center receives heavy use. The gravel parking area can accommodate up to 20 vehicles and trailer rigs, with overflow parking taking place in a grassy area along the road. Off-refuge boat launching sites include Bobby's Fish Camp and the Corps of Engineers' Service Park, both of which charge a $3.00 launch fee; and Lenoir Landing, another Corps facility that does not charge a fee. There is no charge to launch at the refuge's boat ramp (Choctaw National Wildlife Refuge 2004).

Bank fishing is also popular on the refuge. The areas receiving the most use include the mouth of Okatuppa and Turkey creeks, and Judy Slough. A fishing pier at Judy Slough receives heavy use. However, the pier is sometimes blocked by prolific aquatic weeds and debris from high water. Litter is an ongoing major problem at each of these areas, as well as other sites within the refuge.

A fishing and boating brochure is available at the refuge headquarters in Jackson, the Womack Hill Work Center kiosk, and Bobby's Fish Camp. The brochure lists special fishing regulations, including information on closed areas, boat launch sites, safety hazards, and accessibility, as well as a fishing calendar. There is also a map detailing these areas.

Hunting

Hunting on the refuge is guided by a Hunting Management Plan, which was approved in 1982 and amended in 1984. The refuge is open to hunting for deer (only by bow and arrow and hand-thrown spear); feral hogs (only by bow and arrow and hand-thrown spear); and rabbits, squirrels, and raccoons (all three by archery, shotguns, and small caliber rifles). Incidental species may be taken during fall hunts with the legal weapon used for the particular hunt. Incidental species include raccoon, opossum, nutria, coyotes, and feral hogs. Approximately 900 hunters participated in these hunts during the 2003–2004 season. The deer and feral hog hunts draw the largest number of hunters.

Permits are required for hunting on the refuge. While the majority of hunters come from Alabama, states such as Georgia, Florida, Mississippi, and Louisiana are also represented. The front section of the refuge's Hunting Regulations brochure serves as both a hunting permit and an acknowledgement of refuge regulations. A map on the inside of the brochure shows areas open to hunting, as well as those areas that are closed to hunting and all public entry. The permits may be picked up at the refuge office in Jackson; the refuge's Internet website; the Womack Hill Work Center; Bobby's Fish Camp; and the Service campground, which is a U.S. Army Corps of Engineers facility (Choctaw National Wildlife Refuge 2004).

The majority of the areas open to hunting are only accessible by boat. Some hunters use bicycles for transportation once they access the hunt area. Refuge boundaries are clearly marked. Areas not open to hunting are marked with appropriate signs. There are few directional signs directing hunters to hunting areas, which limits use by hunters unfamiliar with the area.

Archery hunts for white-tailed deer and feral hogs are the second most popular public use activity at the Choctaw Refuge. The hunts extend from October 15 until December 1, when they are closed to prevent waterfowl disturbance. Each March, a hog-only bow hunt is scheduled, with a muzzleloader hunt held a week or two later. The refuge's current hunting and fishing plans were developed in the mid-1980s and will be updated after completion of the comprehensive conservation plan.

Wildlife Observation and Photography

Wildlife observation and photography are other public use activities at the refuge. When visiting by boat, the public has an opportunity to observe a wider selection of wildlife within their habitats. Particular sections of the refuge may be closed to the general public during periods of nesting or brooding for sensitive species. Several special use permits are issued annually to photographers. To date, most of the participation in these activities has been incidental, as there are no formal programs to encourage these activities.

The refuge maintains a 2¾-mile multi-purpose driving area. This road system gives refuge visitors access to boat ramps, key bank fishing locations, and wildlife viewing opportunities. The roads do not presently function as a designated wildlife auto drive.

The refuge's main entrance has an overlook and kiosk. The overlook gives refuge visitors a view of a habitat that was historically a highly active wading bird rookery. While the rookery has since moved, visitors can still observe other wildlife that currently use this site, such as waterfowl, alligators, and nonnesting wading birds.

The refuge maintains an observation blind located along a ¾-mile unimproved nature trail. The observation blind is used primarily during the winter months by wildlife observers and photographers when waterfowl are present. Because the trail is unimproved, the nature trail and observation blind are not currently compliant with the requirements of the Americans with Disabilities Act. Informational placards mounted on posts are offered along the nature trail and at the entrance of the observation blind. These placards provide wildlife and plant facts to visitors. Presently, the nature trail and observation blind area is used by both wildlife observers and hunters throughout the year. Refuge management plans to address this conflict if wildlife observation and photography increase along the nature trail or at the wildlife observation blind.

Wildlife observation tours are given upon request to visiting Audubon Society members from Birmingham and Mobile. Tours are led by refuge staff and include key terrestrial viewing locations and boat tours to view waterfowl and bald eagle nesting sites.

Environmental Education and Interpretation

Environmental education and interpretation are also provided on an as-needed basis. The refuge staff has responded to requests for interpretive programs, but there are no refuge-specific programs and no dedicated staff to develop and conduct an effective education, interpretation, and outreach program.

Four high schools and two elementary schools are located in the general area of the refuge, but some of these may potentially close. In recent years, the schools have not requested staff-guided field trips to the refuge, and the refuge staff has not done any outreach to local teachers (Choctaw National Wildlife Refuge 2004).

Occasionally, requests from Scout groups, local schools, and civic groups result in refuge staff giving presentations in the surrounding community. The Choctaw Refuge also participates in Forest Awareness Week Now presentations. These requests occur about twice a year.

The refuge provides information to visitors on the Internet, in the general brochure, at the entrance overlook kiosk, and on small interpretive panels at the overlook and on the nature trail.
The messages on the panels include information on the refuge's habitat and species diversity, the National Wildlife Refuge System, and other standard "off the shelf" materials. The staff occasionally provides guided tours to special groups (e.g., birders) on request. However, the staff is not available to provide regularly scheduled interpretive programs, nor is there a demand for this type of program at the present time.

CULTURAL RESOURCES

Cultural resources include historic properties as defined in the National Historic Preservation Act; cultural items as defined in the Native American Graves Protection and Repatriation Act; archaeological resources as defined in the Archeological Resources Protection Act; sacred sites as defined in Executive Order 13007, *Protection and Accommodation of Access To "Indian Sacred Sites,"* to which access is provided under the American Indian Religious Freedom Act ; and collections. As defined by the National Historic Preservation Act, a historic property or historic resource is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. These include any artifacts, records, and remains that are related to and located in such properties. The term also includes properties of traditional religious and cultural importance (traditional cultural properties), which are eligible for inclusion in the National Register of Historic Places as a result of their association with the cultural practices or beliefs of an American Indian tribe. Archaeological resources include any material of human life or activities that is at least 100 years old, and that is of archaeological interest.

Choctaw National Wildlife Refuge follows these legal mandates to protect the public's interest in preserving the cultural legacy that may potentially occur on the refuge. Whenever construction work is undertaken that involves any excavation with heavy earth-moving equipment, such as tractors, graders, and bulldozers used in the development of moist soil units, the refuge contracts with a qualified archaeologist or cultural resources expert to conduct an archaeological survey of the site. The results of this survey are submitted to the Service's Regional Historic Preservation Officer, as well as the State Historic Preservation Officer (SHPO), which, in Alabama, is a member of the Alabama Historical Commission. The State Historic Preservation Officer reviews the surveys and determines whether cultural resources will be impacted, that is, whether any properties listed in or eligible or eligible for listing in the National Register of Historic Places will be affected. If cultural resources are actually encountered during construction activities, the refuge is to notify the SHPO immediately. To date, no properties on the refuge have been determined to be eligible for listing in the National Register of Historic Places.

This region of Alabama has long been settled and used by humans, in good part because of its mild winters and abundant fish and wildlife resources. Prior to European settlement, a number of Indian tribes inhabited the area in the vicinity of the refuge. In the Mobile Bay–Delta Region, the so-named Pensacola Culture flourished prior to European contact. This culture, which was marked by elaborate ceramics, was practiced by two of many resident tribes of the area, the Mobile and the Tahome. These tribes, along with the Choctaw and the Naniabas, were encountered by the Spanish explorer Hernando DeSoto between 1540 and 1541. The French eventually wrested control from the colonial Spanish and in 1701 established the first permanent European settlement in what is today Alabama. The United States did not retain full possession of Alabama until after a flurry of

power grabs among the French, Spanish, and British between the middle of the 18th century and 1813, when Spain ceded Mobile to the United States. Indigenous interests in the region were officially terminated with the ceding of Choctaw lands in 1830, relegating them to "squatters" after centuries of at times productive, but most often uneasy or explosive coexistence with Europeans and their descendants. Nearly all indigenous people had disappeared from Alabama by the time of the Choctaw cession as a result of disease, warfare, and migration.

The Mobile River Basin is noted for its prehistoric earthen mounds, erected by the area's indigenous inhabitants. Although the first people entered what is now Alabama at least 10,000 years ago, the earliest major phase of earthen mound construction in this area did not begin until some 2,100 years ago. Mounds continued to be built sporadically for another 1,800 years. Of the mounds that remain today, some of the earliest were built to bury important members of local tribal groups. These mounds were usually rounded and dome-shaped. Later mounds were rectangular, flat-topped earthen platforms upon which temples or residences of chiefs were erected.

Previous investigators have suggested the presence of two aboriginal sites on or near the refuge. The first site is an earthen mound. The second is a historic Choctaw site known as Fakitchipunta, which was occupied until 1830 on both sides of the Tombigbee River near the mouth of Turkey Creek. An archaeological survey team in 1978 confirmed the existence of the latter, along with the destroyed remains of an earthen mound in the levee zone of the Turkey Creek mouth (Coblentz 1979).

This survey team, based on collected artifacts, concluded that this levee zone was likely the site of prehistoric settlements. These would have been linearly arranged to conform to the narrowness of the levee. Occupation of the bottoms in prehistory was probably inhibited by poor drainage and frequent flooding. The terminal ridge spurs turned up more artifacts than other zones during the survey, indicating more intensive prehistoric use patterns. These areas would have provided superior vistas for observing game movements, and gentle slopes down to the bottomlands for retrieving food and water. In historic times, the bottomlands appear to have served mainly as forage areas for swine and cattle. Not surprisingly, the topography has proven to be a particularly influential factor for indigenous communities (Coblentz 1979).

Unfortunately, there are major shortcomings in background knowledge specifically concerning the prehistoric periods of the Lower Tombigbee Basin. Although scattered artifacts of projectile points and ceramic wares have been unearthed, few to no conclusions can be drawn with respect to subsistence, social structure, and settlement patterns. This is due to the limited extent of the research performed in this area.

In 1978, an intensive archaeological survey of the refuge was conducted at the request of the Service by the Office of Archaeological Research at the University of Alabama (Coblentz 1979). The survey emphasized 15 areas of the refuge scheduled for improvements, primarily to existing water control facilities, but also improvements to the work area complex and a road situation to the south of this complex. The survey team identified 13 aboriginal or prehistoric archaeological sites and one historic site on refuge property. Evidence collected at the prehistoric sites indicates aboriginal occupancy ranging from 3000 BC through AD 1830. Twelve of the 13 sites are small temporary encampments situated at the upland-bottomland escarpment. These 12 sites appear to have been occupied from the Late Archaic Period through the terminus of the Middle Woodland Period. The remaining site was a large riverine base camp located on an active levee. It exhibits a greater range of different cultural occupations than the 12 upland fringe sites. Of the materials collected from each site, the greatest portion consisted of waste products of stone tool manufacture.

The only intact historic property at the time of the 1978 survey was a poured cement cattle dipping vat or dip tank situated atop a levee adjacent to the Tombigbee River. The dipping vat was constructed by a Mr. Harry Powe for the purpose of removing ticks from cattle prior to shipment across the river, operations which were conducted in the 1920s and 1930s (Coblentz 1979). However, winter floods in 1996 washed away the bank, and the cattle dip tank disappeared into the depths of the river (Baumgartner 1996).

SOCIOECONOMIC ENVIRONMENT

Choctaw National Wildlife Refuge lies entirely within Choctaw County, Alabama, with some 236 acres of Farmers Home Administration properties scattered across Sumter, Conecuh, and Monroe counties. This portion of southwest Alabama is rural, with an economy predominantly based on timber-related industries, farming, and cattle ranching. The City of Mobile lies approximately 80 miles to the south, where the Alabama and Tombigbee rivers merge and flow into Mobile Bay.

Choctaw County is also rural, with only 16 persons per square mile compared to five times that rate for the state overall. Only 6.3 percent of the population works in agriculture, fishing, or hunting. Only a small portion of Choctaw County's land base is used for agriculture (Table 7). Principal crops are hay, cotton, corn, rice, and catfish. Manufacturing is the county's leading industry (Table 8).

Table 7. Percent of Choctaw County land base used for agricultural production

Total Area (square miles)	Area used for agriculture 2002 square miles (% of total)
914	7 (0.8%)

Source: Quick Facts 2000 U.S. Census; USDA Alabama Agricultural Statistical Service

Table 8. Choctaw County employment data

Leading Industry (2000)	Sources of Earnings (2000)	Unemployment Rate (2^{nd} quarter 2004) (AL state: 5.6)
Manufacturing	26.3%	11.0%

Source: Bureau of Labor Statistics; American Fact Finder, U.S. Census Bureau

Alabama presents significantly worse than the national averages for persons below the poverty line, median household and per capita income, unemployment level, and educational attainment levels (U.S. Census Bureau 2005a). Choctaw County conforms to this profile (U.S. Census Bureau 2005b). As Table 9 shows, the county has only two-thirds the median USA per capita income and double the poverty rate.

Table 9. Comparison of geographic and demographic statistics for Choctaw County, Alabama, and the USA

Area	Land Area (sq. miles)	Population (2003 estimate)	Pop. Density (residents per sq. mile)	% pop. change (2000–2003)	Per capita Income	% below poverty	% White	% Black	% Hispanic	% Asian	% Native American
Choctaw County	914	15,284	17	–4.0	$14,635	24.5	55.1	44.1	0.7	< 0.1	0.2
Alabama	50,744	4,500,752	88	1.2	$18,189	16.1	71.1	26.0	1.7	0.7	0.5
USA	3,537,438	290,809,777	80	3.3	$21,587	12.4	75.1	12.3	12.5	3.6	0.9

Sources: U.S. Census Bureau 2005a and 2005b

Table 10. Wildlife-oriented recreation by participants, 16 years old and older, across Alabama

Activity	# of Participants	Activity Days	Average Days/participant	Total Expenditures ($1,000)	Trip-related Expenditures ($1,000)	Equipment and Other ($1,000)	Average Expenditure /participant ($)	Average Trip Expenditure/day ($)
Fishing	1,485,000[a]	22,116,000	17 resident 13 nonresident	1,323,831	694,328	629,503	946 resident 870 nonres.	31 resident 32 nonresident
Hunting	739,000[b]	14,878,000	23 resident 18 nonresident	1,316,421	382,348	934,073	2,069 res. 1,550 non.	26
Wildlife Watching	1,981, 000[c]	NA	NA	1,288,974	189,457	1,099,517	687 resident 616 nonres.	NA

Source: 2001 National Survey of Fishing, Hunting, and Wildlife-associated Recreation: Alabama
[a] 634,000 residents, 851,000 nonresidents
[b] 316,000 residents, 423,000 nonresidents
[c] 965,000 residents, 1,016,000 nonresidents

OUTDOOR RECREATION ECONOMICS

The fish and wildlife of Alabama are economically important (Table 10). In 2001, residents and nonresidents combined spent more than three billion dollars total on fishing, hunting, and wildlife-watching in the state (U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census 2003). Sport fishing, hunting, wildlife viewing, and wildlife photography are economically important to local businesses.

Unfortunately, a general lack of regard for the preservation of fish and wildlife resources, combined with wetland clearing and draining, has led to the loss of valuable fishery spawning grounds and the loss of habitat for many wildlife species. In the attempt to restore and protect some of these resources, Choctaw National Wildlife Refuge serves an important role, not only by providing habitat for a diversity of plant and wildlife species, but also as a place where people can go to enjoy these resources, either through observation or more directly through hunting or fishing.

Choctaw has become embedded in the rural community economy in which it resides, not only with the activities it provides, but through employment opportunities (albeit limited) for individuals on the refuge and in the surrounding area who cater to the needs of refuge visitors. The visitors themselves contribute to the local economy via their spending on goods and services. With improved access, facilities and staffing, the refuge can serve as a pivotal attraction, providing a much needed and important commodity in the economic life of the surrounding community. Hunting and fishing and more recently, ecotourism—which includes wildlife observation, wildlife photography, and environmental interpretation—are increasingly seen as desirable industries. As land development continues and the number of places left to enjoy wildlife decreases, the refuge may become even more important to the local community. It can benefit the community directly by providing recreational and employment opportunities for the local population and indirectly by attracting tourists from outside the area to generate additional dollars for the local economy.

TOURISM

Tourism is a big business in Alabama, contributing $6.7 billion in revenues in 2003 and nearly eight percent of all nonagricultural jobs (Alabama Bureau of Tourism and Travel 2004a). It is estimated that over 18.9 million people visited Alabama during 2003. The Alabama Bureau of Tourism and Travel and many other public and private agencies promote the state's attractions. Among these are a number of tours and trails, including the Civil War Trail, Native American Trail, Fall Color Trail, Alabama Birding Trail, and Covered Bridge Trail (Alabama Bureau of Travel and Tourism 2004b). Choctaw National Wildlife Refuge is listed under the Riverbend Gliders Trail.

Within Choctaw County, tourism contributes modestly to the local economy at the present time (Table 11). Music, festivals, historic sites, and outdoor recreation are some of the tourism opportunities available in Choctaw County. Through further promotion and development of resources, the Alabama Bureau of Travel and Tourism projects that tourism and travel in more rural locales, such as Choctaw County, have the potential to expand substantially. This would benefit state coffers as well as the local economies.

Table 11. Estimated Choctaw County tourism and travel revenues and employment

Total Tourism and Travel Revenues (2003)	Total Tourism and Travel Employment (2003)	Total Establishment Based Employment (private nonfarm)	Total Tourism and Travel Employment Percentage
$3,248,000	73*	3643	2.0

Source: Economic Impact: Alabama Travel Industry 2003 Alabama Bureau of Tourism & Travel
** including 24 indirectly related jobs*

III. Plan Development

PUBLIC INVOLVEMENT AND THE PLANNING PROCESS

Generally speaking, scoping refers to the process by which the planning team gathers input from a variety of internal and external sources on the identification of key issues, concerns and opportunities that are likely to be associated with the conservation and management of the refuge. Internal scoping sources include the refuge staff itself and other Service biologists and professionals in the region. External scoping sources include interested private citizens; research and educational institutions; members of conservation, sportsmen, and civic groups; refuge neighbors; citizens of the local community; and other federal, state, tribal, and local government agencies. These various interests are referred to collectively as "stakeholders," that is, those individuals and groups that have a stake in how the refuge is managed. In developing this comprehensive conservation plan for Choctaw National Wildlife Refuge, the planning team conducted both internal and external scoping.

The first step in developing the refuge's comprehensive conservation plan was a biological review that took place on April 15–18, 2002. A diverse team of eight Service and state agency personnel undertook a holistic examination of the refuge's habitat and wildlife management programs. The team then considered how the refuge might fit into accomplishing a number of landscape conservation needs identified for the National Wildlife Refuge System. This biological review team consisted of staff from the refuge; biologists from the Service's Southeast Regional divisions of Ecological Services, Refuges and Wildlife, and Fire Management; and wildlife and aquatic plant biologists from the Alabama Division of Wildlife and Freshwater Fisheries. The team produced its recommendations in a final report entitled, "Wildlife and Habitat (Biological) Review for Choctaw Refuge" (Choctaw National Wildlife Refuge 2002b). This report was instrumental in developing the alternatives, goals, objectives, and strategies described in this plan.

The refuge's comprehensive planning team—consisting of the refuge manager, a natural resources planner from the Service's Southeast Regional Office, and an outside professional contractor—met for the first time in March, 2004, for a tour of the refuge and an overview of its habitat, wildlife, and public use management programs, facilities, and opportunities. The planning team also conducted additional internal scoping and prepared a preliminary schedule, a mailing list, and plans for public involvement.

The next step in the planning process was a visitor services review conducted in May, 2004, by three Service public use and outreach specialists. This visitor services review team toured the refuge; discussed the current status of the refuge's public use programs; and debated the pros and cons of various recommendations for enhancing and improving these programs over the coming 10–15 years. The recommendations were produced in a Visitor Services Review Report (Choctaw National Wildlife Refuge 2004).

External scoping was accomplished through an open house and public meeting held on June 8, 2004, at the fire station in Gilbertown, Alabama, about 14 miles from the refuge. The meeting was advertised in advance through public announcements and mailings giving the location, date, and time. These announcements were sent to individuals on the mailing list and to the local newspaper and radio station.

Eighteen citizens attended this meeting. The meeting began with a brief overview of the refuge and the comprehensive planning process, followed by a facilitated open-floor question and comment period. The attendees were given the opportunity to ask questions and voice their thoughts and concerns about the refuge and suggestions on how it should be managed in the future. In addition, a

comment form was distributed for the attendees and other interested parties to submit written comments. The written comments were submitted either at the meeting or by mail or e–mail.

ISSUES AND CONCERNS

The following issues and concerns were identified during internal scoping, including the biological and public use reviews, and external scoping, in which the public participated.

WILDLIFE AND HABITAT MANAGEMENT

Invasive aquatic vegetation encroachment needs to be kept under control via cooperative work agreements with the U.S. Army Corps of Engineers and the state. Additionally, to better document the extent of the problem and to track trends over time (including sedimentation problems), aerial and geographic information system (GIS) map documents are needed.

The refuge's Forest Inventory/Management Plan is now dated and should be revised and updated. This will probably require the help of a nearby forester (perhaps from Noxubee National Wildlife Refuge). Some tree harvest removal will be necessary to improve understory and midstory conditions, with an emphasis on regeneration of bottomland hardwood oaks and other mast-bearing trees.

Devices/capability to document refuge habitat types, water coverage, and other factors need to improve, because habitats change over time and change in response to the Corps' flooding regimes. There is a need for some past and present satellite imagery/aerial photos, tied to water gauge readings and different seasons of the year.

Control of feral swine (wild hogs) needs to improve by working with the state, hunters, and possibly permit trappers. Wild hogs have been a growing problem on the refuge and in the area generally over at least the last decade because they degrade habitat and compete with native fauna.

Revise wood duck box and banding activities. Nest box use is suboptimal due to the proximity of the boxes to each other. When old boxes and poles need replacing, use only one box per pole and place the boxes so that one is not within sight of the other. At present, limit wood duck banding to a July to September 20 period (possibly to September 30).

Species of concern and threatened and endangered species, which every national wildlife refuge aims to safeguard. Populations of these species are in decline generally (which is why they were listed), and typically habitat quantity and quality is declining as well, often because of fragmentation.

Moist soil management, which is carried out at the Choctaw Refuge on behalf of waterfowl and shorebirds. Populations of certain waterfowl and shorebird species have declined in recent decades, in most instances because of reduced habitat quantity and quality.

Fisheries management, which is particularly important at the Choctaw Refuge because it is the main public use of the refuge and because three agencies have some interest in it (i.e., U.S. Fish and Wildlife Service, Army Corps of Engineers, and Alabama Division of Wildlife and Freshwater Fisheries). The public often expresses concern about the declining quantity and quality of fisheries on the refuge and Coffeeville Reservoir.

Woodcock, for which there is habitat on the refuge and whose populations have declined in the southeastern United States in recent decades.

Terrestrial nongame birds, which are abundant on the refuge and some of which may be of management concern in the region, or in the case of neotropical migrants, throughout the continent, because of declining habitats and populations.

Instituting permits or user fees. Could revenue from permits or fees be directed toward improving habitat and wildlife management on the refuge and therefore help address chronic funding issues?

RESOURCE PROTECTION

One additional person with law enforcement authority is needed (a dual-function officer) to provide an adequate law enforcement presence. Currently the refuge only has one person with any law enforcement authority. A Biologist/Assistant Manager (wildlife/forestry training) with a desire for collateral law enforcement work would be preferred.

There is a paucity of water quality and contamination data on the refuge, which is important to have in view of fish consumption by refuge users. Monitoring of water quality/contaminants should occur to have baseline data for fish and certain key pools in the refuge. Use Corps data from the nearby river (if available).

Contaminants/minerals, which includes both contaminants in sport fish and avoiding pollution from oil and gas operations.

The protection and preservation of the refuge's cultural resources are an important issue.

EDUCATION AND VISITOR SERVICES

Hunting and fishing are the two primary public uses at the Choctaw Refuge; the former is limited by inaccessibility and the latter is alleged by anglers to be in decline.

Access to the refuge is limited, with most by boat from the Tombigbee River, which is impounded by the Corps of Engineers' Coffeeville Lock and Dam.

High incidence of poverty in surrounding area; the refuge is located in an economically depressed area.

Emphasis on fishing and hunting; given current staffing and budget limitations, as well as the interests of most visitors, the refuge's public use program should continue to emphasize fishing and hunting.

Signage on local roads is limited; directional signs to the refuge need to be added as visitation increases.

Duck hunting is not permitted on the refuge but there is some demand for it. Why not offer duck hunting? At a minimum, consider partial opportunities like lotteries and youth hunts, if not full-fledged hunts.

There is no spring turkey hunt but this should be considered.

Increasing hunting opportunities would increase local support and interest in the refuge and its conservation and management.

Cover for crappie, bluegill, and bass; need more cover in areas that are accessible to anglers. [A fishery biologist clarified for the scoping meeting attendees that invasive emergent vegetation provides more than enough cover on many refuge aquatic sites, but that these areas are inaccessible to boats because of dense mats of plants on the surface.] Consider cutting some trees at water's edge and dropping them into the water to provide structure and hiding places below the water surface.

Fishing quality has declined; due to the "lake effect," fishing quality is gradually tailing off; invasive vegetation has made the situation worse.

Aquatic weeds—hydrilla, water hyacinth, water lilies, and alligator weed—all are serious problems in the refuge's water bodies. They are clogging the areas, making them inaccessible and impassable to anglers.

Opening duck hunting on the refuge could attract many outsiders, making it difficult for local hunters.

Many children in the county are unaware of the refuge.

Fund-raising to help with the underfunding problem; consider innovative ways of raising funds, such as field trials and paid hunts.

REFUGE ADMINISTRATION

Personnel and facility needs, which limit the ability of the refuge to fulfill its purpose. Staffing of the refuge is limited, consisting of the Refuge Manager, an Office Assistant, and two maintenance workers.

Special studies/research, for which the refuge can provide a "natural laboratory" for studies of particular interest to management of refuge resources and/or of interest to the academic community.

Partnerships with conservation groups could enhance wildlife observation opportunities as well as outreach, both of which are presently limited.

Volunteers and partners could assist the refuge, as would a "Friends" group.

Unemployment is high among youth in summer. The county has a dire need for summer jobs. The refuge used to offer modest employment with the Youth Conservation Corps and Young Adult Conservation Corps, but does not do so at present.

Wilderness Review

Refuge planning policy requires a wilderness review as part of the comprehensive conservation planning process. The Wilderness Act of 1964 defines a wilderness area as an area of federal land that retains its primeval character and influence, without permanent improvements or human inhabitation, and is managed so as to preserve its natural conditions and which:

- generally appears to have been influenced primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
- has outstanding opportunities for solitude or primitive and unconfined types of recreation;
- has at least 5,000 contiguous roadless acres or is of sufficient size to make practicable its preservation and use in an unimpeded condition; or is a roadless island, regardless of size;
- does not substantially exhibit the effects of logging, farming, grazing, or other extensive development or alteration of the landscape, or its wilderness character could be restored through appropriate management at the time of review; and
- may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

The lands within Choctaw National Wildlife Refuge were reviewed for their suitability in meeting the criteria for wilderness, as defined by the Wilderness Act of 1964. No lands in the refuge were found to meet these criteria. Therefore, the suitability of refuge lands for wilderness designation is not further analyzed in this plan.

IV. Management Direction

INTRODUCTION

The proposed comprehensive conservation plan contains the goals, objectives, and strategies that will be used to achieve the refuge vision over the 15-year life of the plan.

A total of four alternatives for managing the refuge were considered. The Service has selected Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use Program) as the preferred alternative or proposed action. The other alternatives evaluated were Alternative A, No Action (Current Management Direction); Alternative B, Enhanced Wildlife/Fisheries and Habitat Management; and Alternative C, Enhanced Public Use. All of these alternatives are described and evaluated in the Draft Environmental Assessment (Section B).

Implementing the preferred alternative is anticipated to result in a diversity of habitats for a variety of wildlife and fish species, while meeting the refuge's primary purpose of providing habitat for wintering waterfowl. Specific results are anticipated to include increased waterfowl and songbird use and production; increased habitat for forest interior-dependent wildlife; enhanced resident wildlife populations; restored wetlands and hydrology; and greater opportunities for a variety of compatible wildlife-dependent public use.

An overriding concern reflected in this comprehensive conservation plan is that wildlife conservation is the first priority in refuge management. Public use is allowed only if compatible and appropriate with wildlife and habitat conservation. Wildlife-dependent public uses—hunting, fishing, wildlife observation and photography, and environmental education and interpretation—will be emphasized. Each of these "Big Six" activities is specifically mentioned in the National Wildlife Refuge System Improvement Act of 1997 as being a generally appropriate use of the National Wildlife Refuge System. Of course, for any given refuge, managers must still determine the compatibility of a particular use given specific circumstances.

VISION

Choctaw National Wildlife Refuge was established in 1964 on land in which a management interest was acquired as part of the U.S. Army Corps of Engineers' Coffeeville Lock and Dam project on the Tombigbee River. The Service manages the refuge under a perpetual Lease Agreement with the Corps. In its first 40 years, the refuge focused on providing wintering habitat for migratory waterfowl, nesting and brood-rearing habitat for wood ducks, protection of threatened and endangered species, and public recreational opportunities.

Under the preferred alternative, during the next 15 years, refuge staff would focus wildlife and habitat management efforts in several areas: (1) managing the existing forest to achieve a sustainable bottomland hardwood forest ecosystem; (2) managing invasive aquatic vegetation, both exotic and native; (3) managing invasive terrestrial species of plants and animals, both exotic and native; (4) providing habitat for migratory birds, including waterfowl and neotropical migrants; (5) providing protection for threatened and endangered species that might occur; (6) managing private lands for which the Service has habitat management responsibilities via easements or agreements; and (7) working with other agencies and private interests to control potential problems with contamination and sedimentation.

A healthy refuge environment will also encourage opportunities for visitors to participate in compatible, wildlife-dependent recreation in a natural setting. Fishing, hunting, wildlife observation, wildlife photography, and environmental education and interpretation will all be encouraged. The refuge will also fulfill its obligations to protect cultural resources that may occur. To meet all of the above challenges, the Service will nurture and seek partnerships with other federal and state agencies, interest groups, landowners, schools, and local communities.

MANAGEMENT PLAN SUMMARY

The goals, objectives, and strategies outlined below are the Service's responses to the issues, concerns, and needs expressed by the planning team, the refuge staff, other Service staff, other federal and state agencies, and the general public. These goals, objectives, and strategies reflect the Service's commitment to achieve the mandates of the National Wildlife Refuge System Improvement Act of 1997; the mission of the National Wildlife Refuge System; the Partners in Flight Initiative; the North American Waterfowl Management Plan; the Central Gulf Coast Ecosystem Plan; the U.S. Shorebird Conservation Plan for the Southeastern Coastal Plain/Caribbean Region; the Wading Bird Plan; Partners for Amphibian and Reptile Conservation; the American Woodcock Management Plan; and the purposes and vision for Choctaw National Wildlife Refuge. Depending upon the availability of funds and staff, the Service intends to accomplish these goals, objectives, and strategies during the next 15 years.

GOALS, OBJECTIVES, AND STRATEGIES

GOAL A – WILDLIFE AND FISH POPULATIONS

Maintain healthy and viable native wildlife and fish populations representative of the Mobile River Basin, with special emphasis on waterfowl, other migratory birds, and threatened and endangered species.

Background: The paramount purpose of Choctaw National Wildlife Refuge is given by its enactment legislation: to provide for the conservation, maintenance, and management of wildlife along with connected habitats and resources. The refuge answers to its mandate, while supporting a number of treaties and national and international plans and initiatives (see Chapter I, Background).

The refuge has a variety of habitats, including flooded timber, grasslands, backwaters, lakes, and moist soil areas, as well as management programs, including croplands and waterfowl sanctuary areas that provide feeding, resting, and loafing habitat for thousands of wintering ducks each year and nesting habitat for wood ducks and hooded mergansers. The refuge also prioritizes the protection of the threatened and endangered species present, which currently include the bald eagle and wood stork.

Nongame waterbird groups include shorebirds, marsh and wading birds, and colonial waterbirds. Moist soil units represent an important source of food for these species. Breeding colonial waterbirds and wading birds find nesting habitat in brakes, swamps, and a few wooded impoundments throughout the refuge.

In addition to the wood duck and hooded merganser, the refuge is year-round home to various other species that are native to the Mobile River Basin. These include, among others, the great blue heron, snowy egret, turkey, and white-tailed deer. The Service cooperates with the Alabama Department of Conservation and Natural Resources' Division of Wildlife and Freshwater Fisheries to care for native species that use the refuge.

The refuge, with its expanse of lakes, sloughs, and creeks, is home to fish species like bluegill, chain pickerel, and gizzard shad, as well as species popular with anglers such as crappie, bream, bass, and catfish. The refuge performs some stocking of fish. In general, however, fishery management efforts are limited by the extensive periods of flooding and the unique hydrologic regime on the refuge.

Objective A-1: Migratory Waterfowl Habitat

Within five years of comprehensive conservation plan (plan) approval, provide a healthy bottomland hardwood system and associated riverine and backwater aquatic sites capable of harboring an overwintering population of 8,000–10,000 ducks during key wintering and reproductive seasons, contributing to the North American Waterfowl Management Plan.

Discussion: Concern over waterfowl population declines in the 1980s resulted in the establishment of the North American Waterfowl Management Plan, which focused the attention of federal, state, and private conservation groups on modifying the factors influential in the declines. Foraging habitat was cited as the limiting factor and objectives were set based on food production and acres by habitat type for the complex of habitats, including harvested and unharvested croplands, moist-soil areas, and flooded forest lands. Each of these habitat types is required to provide the variety of food resources (i.e., native seeds, small grains, and invertebrates) required by waterfowl wintering on the refuge.

Midwinter waterfowl surveys have established an average annual peak of 5,000–8,000 ducks and geese at the refuge. With increased hard mast production and improvement of other foraging resources, the refuge should be able to support 8,000–10,000.

Strategies:

Improve the refuge's long-range forest mast-producing capability (primarily oaks) by using group selection forest/tree silvicultural operations on 25-33% of the current bottomland hardwood areas (over a 15-year period).

Reduce the basal area of forested areas. This will help ensure oak regeneration and improve crown size and mast production. Thinning should take place on as much as 33 percent of forested area by no later than 2017.

Use trapping and hunting to reduce overabundant swine, which impede forest regeneration and compete for acorn crops.

Strive to achieve 50 to 75 acres of moist soil sites with good water control capabilities.

Use portable pumps to obtain better water management control. Alternate drawdowns in late spring for some moist soil units, with summer drawdowns on others. Caution should be exercised to not draw down all units at the same time, thereby eliminating important habitat.

Monitor (inspect) drawdown areas to determine plant responses. If desirable plants are not being obtained, employ the following options:

Task/Option 1: Flood deeply and hold for several weeks to kill regeneration of invasive vegetation. Draw down again.

Task/Option 2: Dry the area. Disk and broadcast millets/milo.

Keep good records of moist soil treatments and timing of treatments, including water level manipulation. Archive data/observations, including final results – percent of area with good, fair, and/or poor waterfowl crops.

Prepare a Biological Inventory/Monitoring Plan update that includes waterfowl inventory and monitoring protocols, standardized routes, and computerized databases

Conduct waterfowl inventories at least twice monthly (October to mid-March). Couple aerial counts with ground counts on the more visible areas of the refuge to establish a correction factor for aerial surveys.

Objective A-2: Wintering Waterfowl Sanctuary

Within five years of plan approval, provide (in aggregate) 3,000–4,000 acres of sites where human disturbance to waterfowl is minimal during the mid-November– February period, except during times of youth waterfowl hunt.

Discussion: The small size of this refuge (less than 5,000 acres) requires that several essentially nondisturbance areas for waterfowl be strategically located on the northern, middle, and southern ends of the refuge, where aquatic habitats appear best for waterfowl use. Continual use of motorboats or other similarly disturbing uses would have as much or more impact than even limited waterfowl hunting. Some low degree of disturbance can be tolerated, but too much avian movement and/or frequent flying can have immediate and later indirect impacts, from expenditure of calories and loss of fat reserves, which are translated to direct negative impacts during migration, nesting, and/or overwintering seasons. The proposed youth waterfowl hunt would take place on a small scale for a brief duration and would thus not constitute more than a minimal disturbance.

Migratory waterfowl may fly up to thousands of miles to return to their warm weather habitat. They develop the stores of energy needed for the trip by spending the prior winter consuming high-caloric foods, and resting. More generally, in order for waterfowl to meet life-history requirements associated with required body maintenance and energy needs, pairing activities, molting periods, and roosting/nesting needs, human-related disturbance must remain low during the critical mid-November to late February period.

Strategies:

Continue with the current waterfowl closed sanctuary areas, but consider a mid-November closure versus the current December 1 closure.

During the mid-November–February period, ensure that boating use (for other hunting access) be limited to the main channel of Okatuppa Creek and not throughout the Middle Swamp area.

If other hunting access is allowed in the current waterfowl sanctuary areas, it should be along a narrow corridor and not throughout the closed areas. Preferably, no boating of any kind (except for canoes or electric motors) would be allowed for other hunting access through these sanctuary areas.

No waterfowl hunting should occur in sanctuary areas and very limited if any waterfowl hunting should occur in other areas until at least one more individual at the refuge has law enforcement authority. An exception could be for the 1–2 day National Youth Hunt Days for waterfowl.

Some beaver ponds (even if causing dead timber situations) should not be removed. Assess waterfowl/waterbird usage, and maintain those with favorable use or good brood habitat characteristics, so long as less than five percent of the bottomland hardwood forest is not being impacted by beaver pond construction. Off-refuge impacts will need to be addressed.

Objective A-3: Wood Ducks

To support wood duck production in the Central Gulf Coast, annually maintain and monitor the existing 400 wood duck nest boxes, cleaning at least twice annually.

Discussion: Wood ducks are common year-round residents of the Central Gulf Coast and the refuge. Preferred habitats include forested wetlands, wooded and shrub swamps, tree-lined rivers, streams, sloughs, and beaver ponds. Wood ducks seek food in the form of acorns, soft and other hard mast, weed seeds, and invertebrates found in shallow flooded timber, shrub swamps, and along stream banks. They loaf and roost in more secluded areas and dense shrub swamps.

Wood ducks are cavity nesters, seeking cavities in trees within a mile of water. Brood survival is higher in situations where nests are close to water. Due to loss of bottomland hardwoods and over-harvest, wood ducks were almost extirpated in the early 1900s. Even today, forestry practices and competition for nest sites from a host of other species limit reproduction. Nest boxes are commonly used to supplement natural cavities and increase local production of wood ducks.

Box programs are not a panacea. They must be maintained—requiring time to clean and repair. Production can be increased by more frequent checks and cleaning of boxes, but the benefits must be weighed against potential benefits of other time-intensive activities. Twice-a-year cleanings have been found to maximize benefit for the refuge insofar as its investment of resources. Boxes that cannot be properly maintained should be boarded up until sufficient effort can be expended. Poorly maintained boxes can act as traps for the hen and her clutch.

Strategies:

Use properly located and maintained wood duck boxes to improve wood duck nesting and production of young. Develop and continually maintain a GIS database for the locations of boxes.

Follow regional guidelines for wood duck management (see the updated 2003 Regional Wood Duck Guidelines). This will require moving/removing some boxes to reduce excessive dump-nesting potentials.

Ensure boxes are in locations most conducive to brood use (See the 2003 Regional Wood Duck Guidelines for descriptions of good brood habitats). As existing wood duck nest boxes deteriorate, replace and relocate boxes to meet regional guidelines.

Use only one box per pole. Try to locate boxes so one box cannot be seen from another box, in order to discourage dump-nesting by hens.

Ensure proper predator guards. Nest boxes should be located over water (with no flooding over boxes in spring/summer), or within one mile of water with scrub-shrub habitat nearby. Boxes should be free of overhanging limbs.

Boxes should be checked at least twice (once before nesting season to refurbish and repair) and again in early summer to record use. Follow regional wood duck guidelines for recording usage. Preferably, check boxes (1) before nesting season, (2) during early spring/summer to remove already hatched eggs, and (3) in late summer to record final usage and to clean.

If accessible, beaver ponds should be assessed for potential wood duck box locations (good brood habitat).

Objective A-4: Neotropical Migrant Birds

Within five years of plan approval, increase knowledge of species status by conducting annual surveys to collect baseline data on neotropical migratory bird use of the refuge and encourage population increases due to forest habitat management.

Discussion**:** Prior to European settlement, the Central Gulf Coast contained vast swaths of bottomland hardwood forest, which supported a wide variety of wildlife species. Today, more than three-quarters of the original forest has been lost to land clearing associated with agriculture, commercial logging, transportation, industrialization, and urbanization. The geography of the remaining acreage of bottomland hardwood forest is, in essence, one of numerous islands surrounded by an inhospitable sea of human-altered landscape. The upland forestland has been similarly impacted in the Central Gulf Coast Ecosystem. This fragmentation has proved detrimental to both migrating and breeding interior forest birds that depend on large blocks of ten thousand acres or more.

Notwithstanding the widespread fragmentation, the region remains an important breeding ground and winter sanctuary for forest-breeding birds. Southwest Alabama lies within the Partners in Flight Southeastern Coastal Plain Bird Conservation Region (BCR #27). Although such avian species are found in modest numbers on the Choctaw Refuge (and surrounding lands) due to the birds' preference for larger blocks, there is potential for this habitat to play a larger role for a wide range of nongame birds. Population levels may be bolstered through forest stand improvement without expansion beyond the refuge's current borders. Through ongoing management, forested wetlands with high vertical structure should be promoted and maintained, with shrubs and small trees in the understory. Particular effort should be made to maintain and promote shrubs that support fleshy fruit and cover for transient landbirds.

To date, no comprehensive survey of forest birds, breeding or migratory, has been completed on the refuge. As such, there is almost no information on what areas and habitats are most widely used. Establishing baseline figures will also allow refuge staff to assess the effectiveness of and improve future management actions.

Strategies:

Determine the status/usage of swallow-tailed kites on the refuge and surrounding landscape. Use boat surveys and/or aerial surveys to record refuge use (nesting, foraging, and roosting).

As part of monitoring program for both canopy and understory-dwelling birds, ensure that georeferenced (global positioning system, or GPS) habitat data is collected and documented on all point locations. All data should be translated into a GIS database for analysis and distribution.

Conduct point count surveys once per year, in mid- to late May.

Conduct the point counts in the same sequence from one year to the next (i.e., same direction and sequence of points within a morning and among mornings), with the same observer, if possible.

Compare productivity of breeding birds in mature forest adjacent to “hard” agricultural edges and adjacent to “soft” moist-soil, scrub/shrub, or reforested edges.

After five years of baseline data, begin more involved protocols to address not only species occurrences, but also their relative rates of reproductive success and/or post fledging survival in response to management protocols.

Generate GIS databases that display GPS survey points by habitat types and associated structure and species distribution and occurrence.

Increase forest stand structure with emphasis on imported vertical understory along with retention of some of the largest trees.

Promote fleshy fruit by producing shrubby conditions through appropriate use of restoration techniques (e.g., mechanical and fire) to set back succession of forest in select locations and increase the amount of light reaching the forest floor.

Employ group selection-sized openings to promote structural complexity and support regeneration of shade-intolerant species (e.g., red oaks) where needed.

Increase stand structural diversity by favoring retention of the largest trees and removing surrounding less favorable (often long-suppressed) trees. Also, give preference to more cavity-prone species.

Establish age-stratified experimental plots in order to determine the best hardwood forest harvest treatments.

Establish at least five control plots with no timber management, where only monitoring of bird populations and vegetation occur.

Establish at least five lots emphasizing harvest management using multiple single-tree and group selection cuts to reduce basal area.

Determine the best long-term strategy to promote fleshy-fruiting shrubs and small trees throughout the forested wetlands (within the next 15 years) to support good and dependable stopover habitat for transient land birds from one year to the next.

Monitor bird population responses to habitat restoration/manipulation on five control and experimental plots in order to determine the best strategy for promoting fleshy-fruiting shrubs and small trees within the next fifteen years. Use transects (migration monitoring) protocols for tracking timing and extent of transient landbird use of this refuge.

In terms of achieving population objectives for bottomland forest species, an average of 6–9 pairs of Swainson's warblers (drier end of the spectrum) and 11–19 pairs of prothonotary warblers (wetter end of the spectrum) per 100 acres within optimal habitat could be considered as indicators of healthy neotropical migrant populations overall. Spot-map protocols could provide these data. Monitoring nest success would provide better evidence of population health.

Objective A-5: Water Birds

Within three years of plan approval, determine the feasibility of using an existing small impoundment (moist soil unit) and/or establish a new impoundment to provide small fin-fish for waterbirds. Use standard protocols to track abundance of wading birds.

Discussion: Choctaw National Wildlife Refuge provides excellent habitat for post-breeding wading birds, as evidenced by the number of wood storks and other wading birds observed in late summer and early fall at the Blue Field Area. This area, as well as other shallow water impoundments scattered throughout the refuge, provide critical foraging opportunities for long-legged wading birds such as herons, egrets, and ibis during the late summer and fall. High priority water birds for this refuge include the little blue heron, tricolored heron, and white ibis. Of moderate priority are the anhinga, snowy egret, and black-crowned night heron. Local interest water birds include the pied-billed grebe, great egret, yellow-crowned night heron, and the wood stork.

Populations of wading birds can be boosted higher still by adding a new impoundment to the refuge. Although management is complicated by frequent flood conditions on the refuge, the addition of water control devices will allow for the shallow water conditions attractive to water birds, especially when stocked with the sunfish and other forage species favored by wood storks and allied species. Moist soil units have the added advantages of protecting nests of nesting birds in the spring from predation by raccoons, serving as a tool against invasive species, and boosting production of hard mast sought by waterfowl.

Strategies:

Determine feasibility of establishing a new impoundment to provide small fin-fish for water birds. Emphasis should be on wood storks. Check with the Savannah Coastal Refuges for guidance regarding stocking of forage fish.

Establish some standardized survey routes along levee roads, boat trails, and other locations in order to track abundance and response to management regimes. The object is late summer and fall migrant numbers. Design censuses in accordance with the techniques outlined by the International Shorebird Survey (ISS) protocol.

Objective A-6: Threatened and Endangered Species

Over the life of the plan, protect and monitor bald eagle nests, and within three years of plan approval, conduct trapping, tagging, and monitoring studies of wood storks to determine movements of birds occupying the refuge.

Discussion: As do many states, the State of Alabama keeps a continually updated list of sensitive plants and animals that are threatened, endangered, or of concern in Alabama itself. The Alabama Natural Heritage Program uses a ranking system developed by The Nature Conservancy, under which each listed species is assigned two ranks, one representing its range-wide or global status, and the other representing its status in the state. The Alabama Natural Heritage Program indicates

that two federally listed threatened and endangered animal species occur on the refuge: the threatened bald eagle (which has been proposed for delisting) and the endangered wood stork.

The goals for eagle recovery in Alabama were met several years ago due in part to the eagle hacking effort in which Choctaw National Wildlife Refuge participated. According to the Alabama Division of Conservation and Natural Resources, 13 birds were hacked in 1991. In 1996, the first eagle nest on the refuge was documented, but did not produce young. In 1997 through 2002, the nest was occupied and produced one bird each year except in 1997 when two birds fledged and in 2001 when none were fledged. There are existing guidelines that protect the bald eagle, its nest and immediate habitat from disturbance. In the event that the bald eagle is delisted, it will continue to be protected by the Bald Eagle Protection Act, which prevents takes without permits.

The wood stork is only a slightly more common sight at Choctaw than the bald eagle. However, a University of Florida researcher has affirmed that wood storks tagged at a colony site near Miami are using areas in or near the refuge. Noxubee National Wildlife Refuge also captured and tagged wood storks from the Florida group this summer on the refuge. Choctaw should conduct similar trapping, tagging, and monitoring studies to determine movements of birds occupying the refuge. Valuable information could be ascertained regarding foraging, roosting, and migrating patterns via satellite tracking. Protection of the wood stork should take the form of providing sufficient foraging (e.g., moist soil units stocked with fin-fish) and roosting habitat with a minimum distance required of visitors in order to safeguard the bird's sanctuary.

Strategies:

Monitor and survey the refuge and nearby habitats for eagle densities during key periods of the year (winter and nesting seasons), also noting location of nests.

Minimize disturbance activities near eagle nests using regional and Alabama distance guidelines.

Provide sufficient sanctuary for roosting eagles and wood storks.

Enhance, restore, protect and manage habitat using available conservation tools, including habitat management on existing land, conservation easements, partnership agreements, and conservation agreements.

Search for and map key areas being used by wood storks. Monitor and maintain records of sightings, including location and habitat type, especially before the GPS tagging project is implemented.

Explore the feasibility and develop a plan to trap and GPS-tag wood storks to help monitor their movements.

Stock small sub-impoundments with crayfish or small fish to provide foraging sites for storks.

Objective A-7: Management of Invasive Animals

Increase control of feral swine to protect wildlife and the ecosystem.

Discussion: Not all nonnative wildlife is "invasive"—only those that are or are likely to be a blight to the economic or environmental well-being, or cause harm to human health. It is imperative that the exploding population of feral hogs be checked, as this invasive competes directly with other species

for resources, especially waterfowl. Swine also interfere with reforestation efforts and depredate the nests of ground-nesting birds, many species of reptiles and amphibians, and young birds and mammals. Moreover, they cause considerable damage to dikes, roads, and other refuge structures.

The refuge has been conducting an ongoing feral hog eradication program in recent years. However, no additional staff or dollars have been provided to address this issue. Staff estimates cite a likely increase in the feral swine population over recent years. The reduction in feral hogs during fall hunting season and the two-day muzzleloader hunt each March are essentially offset by the influx of new hogs from areas around the refuge. Public hunting should be used in conjunction with other management actions to attempt to control swine. These actions should include cooperation with other agencies and with neighboring landowners to check feral swine populations in areas near the refuge that potentially could impact the refuge. In the last year, feral hog numbers on the refuge appear to have declined, perhaps because a nearby landowner has trapped and killed large numbers of them.

Strategies:

Continue to use approved biological, chemical, and lethal means to eradicate these invasive species.

Implement an aggressive feral hog control program using a variety of techniques, including sustained baiting, trapping, and culling. Conduct only tightly controlled hunts carried out by Service personnel with the cooperation of adjacent landowners with the intent to manage the hog population.

Maintain current levels of hunting pressure by the combination of deer and swine archery hunts and the swine-only archery and muzzleloader hunts. Consider expansion of public swine-only hunts when possible.

Continue as much as possible the practice of incidental take of hogs by Service personnel during performance of routine duties.

Continue force-account trapping to the extent possible. Pre-bait open traps until regular swine use is observed. Traps should be set only when significant numbers are coming to the bait on a daily basis. Portable traps that can be moved to areas of heavy swine use are often more effective than permanent traps.

Explore the possibility of issuing special use permits for one or more local parties willing to trap swine on the refuge. Contractors would provide all materials and expenses in exchange for all the captured swine. A provision of the permit would be that none of the captured swine would be released or sold alive at any location.

Develop an outreach program that focuses on the impact and potential sources of invasive species like hogs and techniques for eradication.

All hunting activities are currently hindered by a lack of authorized law enforcement personnel. As the refuge currently has only one staff member (the Refuge Manager) with law enforcement authority, an additional enforcement staffer should hired, preferably a biologist with some law enforcement authority.

Partner with other agencies and cooperate with neighbors to find and implement the most effective means of reducing and permanently controlling the feral swine population.

Objective A-8: Game Species

Over the life of the plan, continue annual planting of four to eight winter food plots totaling approximately six acres to benefit and manage game species, such as white-tailed deer, wild turkey, and woodcock.

Discussion: In order to maintain a supportable deer herd that does not exceed the carrying capacity of the refuge to feed it, the herd size must be kept in check. Without predators like wolves and cougars, and only controlled hunts to stabilize deer numbers, there is the danger of the herd overrunning the resources of the refuge. So that the existing deer don't ravage the understory and overcompete for hard mast with waterfowl, the deer must be protected from famine in winters. The herd must be provided with ample hard mast (see Objective B-1) as well as browse and winter grains and grasses to supplement the variable and limited winter food sources on the refuge.

At Choctaw National Wildlife Refuge, cropland should be limited to the minimum necessary to meet wildlife objectives based upon projections for net crop needs and native production at the refuge. That is, food plots will serve only to supplement the browse that occurs naturally. Because all fields are force-account farmed by Service personnel, no crops are harvested; all are left in the field for the animals. There are a number of different crops that fit well with the dietary patterns of wildlife. These include annuals such as winter wheat, ryegrass, and sunflowers.

(See Objective B-1 on forest management for strategies to ensure sustainable mast production.)

Strategies:

Acreage of cropland should be limited to the minimum necessary to satisfy refuge wildlife objectives.

Cropland activities should be accomplished through minimal artificial manipulation of the refuge land so as to provide positive contributions to a wide diversity of indigenous wildlife and habitats.

Winter crops may include rye and ryegrass, sunflower, chufa and winter wheat, and Japanese and brown top millet. Both crops and fields—there are currently 60 acres of refuge cropland area—should be rotated.

Management techniques should be employed to control encroachment by invasive plant species. This may be accomplished by reflooding and discing lightly a field previously cultivated without fall discing.

In addition to large mast-producers, it is important to create and maintain understory species like dogwood, wild cherry, grapes, and berries, which are important in the wild turkeys' year-round diet. These species benefit a variety of wildlife and migratory birds and should be protected during cutting and thinning operations.

Objective A-9: Shorebirds

Within five years of plan approval and to increase shorebird use of the refuge, manage for a maximum of 30 acres of shallow, unvegetated mudflats for spring and fall migrating shorebirds and conduct shorebird monitoring surveys using the International Shorebird Survey Protocol.

Discussion: Opportunities exist to provide good habitat on the refuge for fall southbound migrants. These can be included as a component of a mosaic of habitats that will include areas with water control. As such, management units (including moist soil units) can be carefully controlled so that they are flooded two weeks prior to mudflat drawdown in order to allow sufficient invertebrate buildup. Providing shorebird habitat is considered a high nongame bird priority for Choctaw National Wildlife Refuge and supports the goals of the Service's U.S. Shorebird Conservation Plan, Southeastern Coastal Plain–Caribbean Region.

The bulk of the refuge's habitats consist of bottomland forests, sloughs, and the Tombigbee River. The riverbank tends to be steep and does not include large areas of gently sloping flats with the shallow water and mudflats favored by shorebirds. Thus, the refuge does not contain large areas of suitable shorebird habitat. Nonetheless, its moist soil units and to some extent its croplands can be managed to benefit shorebirds. At present, the only shorebird listed as common at the Choctaw Refuge is the killdeer. Several other species are listed as rare, occasional, uncommon, or suspected, including the lesser yellowlegs, spotted sandpiper, least sandpiper, common snipe, and American woodcock.

Strategies:

Where feasible, include late summer/early fall shorebird habitat (i.e., shallow, unvegetated mudflats) as a component of a mosaic of habitats available each year at the refuge. Such management units should be flooded approximately two weeks prior to mud flat drawdown to allow sufficient invertebrate buildup.

Provide some shorebird habitat on several of the potential moist soil units on the refuge. For fall migration, shallow water habitat should be provided from early July through late October.

Conduct shorebird monitoring surveys using the International Shorebird Survey protocol.

Objective A-10: Amphibians and Reptiles

Within five years of plan approval, conduct surveys to identify critical breeding habitats, inventory populations, and develop protective measures, if necessary.

Discussion**:** Other than alligators, the refuge has never been systematically surveyed for reptiles or amphibians. Baseline information is needed on the presence, abundance, and distribution of herpetological species on the refuge. Given the refuge's location and habitat types, it is strongly suspected that reptiles and amphibians are important constituents of the ecosystem. They are probably abundant and functionally important in both freshwater and terrestrial habitats. Many species of herpetofauna are wide-ranging and may serve as key indicator species in evaluating the environmental health of an ecosystem. Knowledge of which species occur on Choctaw National Wildlife Refuge is fundamental to an understanding of the biodiversity of the area.

Strategies:

Use university or U.S. Geological Survey personnel to conduct a basic amphibian and reptile survey of the refuge, using accepted scientific census techniques.

Review the Partners for Amphibian and Reptile Conservation Plan for species of concern and focus on refuge sites potentially harboring those groups. Also, look into the North American Amphibian Monitoring Program developed by the U.S. Geological Survey to monitor amphibians via calling surveys.

Maintain quality of wetlands (water quality). Monitor water quality trends and/or obtain Corps and/or state data to track trends.

Objective A-11: Fisheries

Within one year of plan approval and to improve fisheries on the refuge, develop a formal agreement with the state on additional fish habitat improvement projects.

Discussion: As indicated in Chapter II, fishing is the most important wildlife-dependent recreation that takes place on the refuge. Fish populations are also an important food source for other wildlife, both birds and mammals. The refuge presently partners with the Corps and Alabama Division of Wildlife and Freshwater Fisheries in the management of fisheries, including stocking, surveys, and the control of invasive aquatic plants that threaten fisheries, fish habitat, and access to fishing areas.

Strategies:

Conduct/prioritize invasive aquatic plant control in areas that will allow better access to anglers (i.e., Judy Slough; the slough in front of the maintenance building; and Turkey Creek).

Determine if there are areas in winter (backwater areas) where some public fishing can take place without disturbance to migratory bird sanctuary areas.

Engage the Corps as a full partner in helping to meet refuge goals for fisheries, invasive plant control, and water level management.

Determine if commercial fishing at Choctaw is appropriate and compatible, and terminate within five years if those standards are not met.

Additional habitat improvement projects might include felling selected trees along river and slough banks to provide additional underwater structure and cover.

GOAL B – HABITATS

Conserve, manage, and enhance the natural diversity, abundance, and ecological functions of refuge habitats in support of national and regional plans.

Objective B-1: Forest Management

Within 15 years of plan approval, achieve 3–5% early successional openings in Choctaw forests and improve understory and midstory vegetation layers to help many species of forest-dependent wildlife.

Discussion: The great majority of trees at Choctaw are aged 50–70 years. Currently the upland pines and hardwoods exhibit exaggerated homogeneity because no major harvests have taken place since the years prior to the fee title purchase by the Corps. This is an invitation to invasive plants while it simultaneously discourages diversity in wildlife. To increase both vertical structure and stand diversity, group selection cuts are recommended.

Wildlife game studies have found that as little as 3–5% of a forest land base managed in early successional openings can yield appreciable population gains. This is demonstrably true for white-

tailed deer, northern bobwhite, and wild turkey. It is also true for migratory species such as American woodcock as well as herpetofauna and invertebrate populations. Whether the openings occur as a result of small clearcuts, roadways, pipelines, tornadoes, or bulldozers is of little importance. The important point is to maintain these critical feeding and reproductive areas, especially in the Choctaw Refuge, where there is little grassland or shrub-scrub habitat. In fact, for resident wildlife game species, it would be difficult to overstate the importance of managed early successional areas in the Choctaw Refuge. Scarcity of areas important for brood-rearing or "bugging" for ground-nesting birds assures these patch openings will be used in far greater proportion to their availability.

Mature, open, bottomland hardwood forests are biological deserts for most resident wildlife game species for nine months of every year if judged on food availability, brood-rearing, and nesting cover, although with good forest management this can be remedied. On the other hand, a number of interior forest birds, among them certain neotropical migrants, depend on fairly large blocks of unfragmented forest. (Managing for up to 3–5 percent clearings apparently does not constitute forest fragmentation from the point of view of interior forest birds.) Focusing grassland and shrub management for wildlife along road shoulders, fire breaks, and proposed or existing openings is encouraged in the interest of good forest management and the reduction of fragmentation.

The overall emphasis in managing mature bottomland forests at the Choctaw Refuge would be on (1) increasing stand structural diversity by favoring retention of the largest trees (removing surrounding potentially competing trees); (2) opening up stands to allow light to reach the ground in support of better understory structure; and (3) group selection-sized openings to further structural complexity and support regeneration of shade-intolerant tree species (oaks) where needed.

Hard mast production is highly variable in the South compared to the Midwest. Southern hard mast crops may fail two out of every five years. Heavy hard mast crops occur generally every 4–6 years. To avoid constant fluxes in resident wildlife game populations due to hard mast crop variability, there must be openings somewhere in order to meet critical nesting, brood-rearing, "bugging", and browsing habitat needs for ground-nesting birds and white-tailed deer. With planning, these openings can be accomplished without sacrificing habitat requirements for desired avian species such as neotropical migrants.

As stated in Chapter II, the Choctaw Refuge has a Forest Management Plan dating from 1986, but it has never been fully implemented due to limited funds and staff. Much of this plan remains relevant, but it should be updated to reflect current policies, mandates, and thinking with regard to managing forests for wildlife benefit.

Strategies:

Use silvicultural methods to increase light reaching the forest floor (establish experimental plots, stratified by age, to determine best hardwood forest harvest treatments).

Establish at least five control plots with no timber management, where only monitoring of bird populations and vegetation occur.

Establish at least five plots emphasizing harvest management using multi-single-tree group selection cuts to reduce basal area.

Strive for some trees with greater tree height; more cavity-prone species; while also promoting increases in understory structures. (The purpose is to benefit both canopy- and understory-breeding species.)

Use a Service forester within the Southeast Region to update the refuge's Forest Management Plan within one year of approval of the comprehensive conservation plan.

Add one full-time wildlife biologist with forest management experience or a forester with wildlife management experience to refuge staff to implement the refuge's Forest Management Plan and related wildlife habitat improvement projects.

Monitor wildlife responses to habitat changes, in particular American woodcock, which should be a beneficiary of such changes.

Continue implementing the refuge's current Fire Management Plan, which calls for complete suppression of all wildland fires and no prescribed fire on the refuge.

Objective B-2: Creeks, Wetlands, and Slough Management

Within three years of plan approval, reduce the incidence of emergent, invasive aquatic vegetation in the wetlands and sloughs within the refuge, to achieve a 50:50 ratio of open water to aquatic plant coverage.

Discussion: The Choctaw Refuge provides funding for the Alabama Division of Wildlife and Freshwater Fisheries to use boats and occasionally helicopters or other methods in the chemical treatment of waterways choked by invasive aquatic vegetation. These treatments are successful in controlling the various invasive aquatic species mentioned in Chapter II, but they must be repeated every year. Without them, a thick layer of emergent plants would occupy the surfaces of most of the refuge's sloughs, backwaters, and creeks, rendering them all but inaccessible to boat travel by anglers, but also sharply reducing their habitat value for fish. The objective should be to try and maintain key wetland/waterfowl areas to no more than a 50:50 ratio of open water to aquatic plant coverage.

Strategies:

Within one year of plan approval, develop and begin to implement a formal agreement with the state to increase control of invasive aquatic species.

If nonfood (waterfowl) aquatic plant coverage exceeds 50%, work with state and Corps to reduce coverage, using approved chemicals as needed.

Work with the state to resolve issues of jurisdiction over aquatic habitat within the boundaries of the refuge so that a formal agreement can be reached that would allow for stepping up control of invasive aquatic species over a larger area.

Objective B-3: Moist Soil Management

Within three years of plan approval, improve moist-soil management by leveling and regrading all units; use portable pumps to facilitate water management and lengthen the hydroperiod; and increase the size of the moist soil management area from 15 acres to 25–35 acres from existing crop fields.

Discussion**:** Moist soil management refers to the management of land to provide moist soil conditions during the growing season to promote the natural production of beneficial plants. The seeds produced by these plants often attract and concentrate waterfowl and other wetland wildlife species. The decomposing vegetative parts of moist soil plants also provide substrate for invertebrates, which

are critical food for many wetland wildlife and fish. Although small grain crops provide high energy for migrating waterfowl, these artificial foods do not provide the same nutrients found in these natural foods. The loss of wetlands in the surrounding areas has made these artificial wetlands essential to the health and survival of wetland-dependent wildlife species. It is imperative to only manage those areas that can be managed well. Poorly managed moist soil units provide greatly reduced benefits to waterfowl and shorebirds and may develop into thick willow stands or cultivate invasives and pest plants. At present, Choctaw has four small moist soil impoundments on the north end totaling 15 acres at any one time (on about 40 acres of land in total). As stated in the objective, new moist soil acreage would come from existing cropland.

Strategies:

Moist soil impoundments should be monitored several times during the year to change/refine management manipulations to control undesirable plant communities.

Place water control gauges in all key impoundments to correlate water levels with management practices and plant responses.

Record water depth conditions at time of drawdowns and at least twice a month during growth in spring/summer.

Prepare a Water Management Plan that covers each unit (record data/responses monthly).

Sample plant responses within the first 30 days of drawdown or water manipulations, and respond/change water management as needed.

In late summer–early fall, sample moist soil impoundment plant communities to determine, at a minimum, the percentage of poor, fair, and good waterfowl foods available per impoundment.

Use portable pumps to obtain better water management control (drawdowns in late spring on some units, with summer drawdowns on others; but do not draw down all at the same time).

Monitor (inspect) drawdown areas to determine plant responses; if desirable plants are not being obtained, either (1) flood deep and hold for several weeks to kill regeneration and then draw down again, or (2) dry the area, and then disk and broadcast millets/milo.

Keep good records of moist soil treatments and timing of treatments (including water level manipulations); and archive data/observations, including final results (i.e., percent of area in good, fair, and poor waterfowl foods).

Objective B-4: Farming

Over the life of the plan, gradually phase out farming units by converting them to moist soil units.

Discussion: The refuge cultivates crops on about 60 acres, of which half–or 30 acres–are being cropped at any one time. Wildlife-friendly crops include millet, Japanese millet, sorghum, buckwheat, rye, rye grass, wheat, and clover. The refuge staff believes that wildlife would be better served by converting these lands to moist soil units, because these provide food with broader nutritional value than crops alone.

Strategies:

Over the 15-year period, convert 25–30 acres to moist soil units every five years.

Continue to use same farming equipment for moist soil operations.

Objective B-5: Controlling Invasive Upland Plants

Spray cogongrass annually on all known sites to eradicate it from refuge.

Discussion: Cogongrass is an invasive plant from Asia that infests Gulf Coast wetlands, savannas, and forests. It is considered one of the 10 worst weeds worldwide and a pest in 73 countries (Farris 2001). This highly flammable grass outcompetes desirable native grasses for nutrients, but it is a very poor forage plant (Coblentz 2003). It invades and takes over disturbed ecosystems, forming a dense mat of thatch and leaves, making it nearly impossible for other plants to coexist. Large infestations of cogongrass can alter the normal fire regime of a fire-driven ecosystem by causing more frequent and intense fires that injure or eliminate native vegetation (Plant Conservation Alliance 2004). The weed propagates itself through wind-blown seeds and by rhizomes, which are underground, horizontal stems capable of producing roots and shoots. It is difficult to destroy, and mowing and pesticides only temporarily slow its spread. Scientists are currently studying how management practices can affect cogongrass invasions in the Gulf states.

Strategies:

Cooperate with U.S. Fish and Wildlife Service scientists and other researchers in developing improved methods to control cogongrass.

Stay abreast of latest promising research and control methods for cogongrass and other invasive upland species.

Conduct annual surveys for cogongrass, using GPS technology to record its distribution and GIS to maintain databases and map changes over time.

Experiment with integrated approaches to cogongrass management, including the use of chemical, mechanical, and cultural methods.

Increase rate of spraying so as to eradicate the plant on the refuge.

Monitor and record significant infestations by other upland weedy species.

GOAL C – RESOURCE PROTECTION

Identify and conserve cultural and natural resources on the refuge and promote conservation through interagency and private landowner cooperation, partnerships, and land protection programs in the Lower Tombigbee watershed.

Objective C-1: Sedimentation and Contamination

Within 10 years of plan approval, reduce sedimentation rates on the refuge; and within five years of plan approval, assess and document the extent of contamination on the refuge from environmental toxins.

Discussion**:** This objective addresses two of the phenomena contributing to long-term environmental degradation on the refuge: sedimentation and contamination. Sedimentation has been gradually filling up Choctaw's creeks and sloughs. While a natural process, it has been exacerbated by off-refuge land uses within the watershed upstream (principally logging, agriculture, and construction). An additional contributing factor is water level management on the Coffeeville Dam, which ensures that much of the refuge is under water for much of the year, and thus subject to sedimentation from the reservoir. Various types of contamination can originate from several sources, including oil and gas extraction, storage, and transport; spills on the river; lead shot; and mercury from atmospheric fallout or deposition.

To reduce runoff-carrying sediments and possibly contaminants onto the refuge, best management practices (BMPs) such as drop inlet structures, minimum till practices, vegetative field borders, and grassed waterways should be installed on agricultural lands in the watersheds, and some of the agricultural lands with high erosion rates should be revegetated. Similarly, forestry BMPs need to be used on lands subjected to logging.

A regular sampling and monitoring program should be implemented on the refuge to detect the existence of any threat levels for known contaminants, and to establish baseline levels for future reference. In addition to testing for concentrations of banned and current use pesticides, data should be collected on water temperatures and pH, as well as on levels of suspended solids, turbidity, nutrients and dissolved oxygen. Each of these parameters represents a potential threat to fish and crustaceans, not to mention the birds and other species on the refuge that depend upon them as key food sources.

Strategies:

Explore methods and options with the Corps and the state to reduce silt loads being deposited within the refuge (i.e., reduce prolonged flooding of the refuge through modifications of the Corps' river stage levels).

Document trends (e.g., via photos) of siltation problems (i.e., changes in water depths at major sites and invasion of willows).

Initiate agreements with the Corps and the state to use approved methods for controlling invasive aquatic plants (mechanical/chemical).

Within three years of plan approval, begin to use aerial and GPS/GIS techniques to show current colonization by plants and to document sedimentation trends over time.

Within seven years of plan approval, develop and begin to implement a multiagency plan to control sedimentation.

Use the Service's expertise to conduct a new, comprehensive survey on contaminants in the refuge.

Within three years of plan approval, update the refuge's Oil and Hazardous Substances Contingency Plan.

Work to prevent any refuge locations of barge-docking stations; rights-of-way for fossil fuels and similar facilities; and oil/gas mineral extraction with the potential for spills or overflow (in order to maintain water quality that is conducive to invertebrates important for waterfowl protein needs and also to reduce disturbance impacts).

Use nontoxic shot (in shotguns) to help prevent deposits of lead shot on areas with potential for use by waterfowl.

Work with the Corps to see if several water quality stations are or can be established on refuge sites (especially near other sources of water, such as major streams and creeks flowing into coves and bays).

Coordinate with the U.S. Geological Survey and the Service's Ecological Services Field Office in Daphne, Alabama, to look at five-year trends for certain contaminant problems (e.g., trends in metals, pesticides, and phosphates). Establish some baseline data for comparison with future years.

Establish water gauges along selected points of the refuge and correlate readings with satellite scenes of refuge water coverage (to help determine water coverage at critical water gauge readings).

Ensure minimal oil/gas and mineral development as allowed by current land ownership rights with emphasis on preventing negative impacts to habitats and wildlife usage (e.g., disturbance). If such developments cannot be prevented, then timing of activities, access routes, mitigation, and other factors become important options to discuss with Ecological Services personnel.

Work with Ecological Services and the Corps to sample key fish species for contaminants. Alert the public if problems in contaminant concentrations are noted.

Prepare a brochure or handout on the refuge's sedimentation problems for distribution to upstream landowners. The brochure would include information on any actions they can take to help reduce erosion and sedimentation.

Provide information to private landowners and initiate discussions with other agencies on methods of reducing sedimentation

Work with local news media to disseminate information on the refuge's sedimentation and contamination issues.

Objective C-2: Private Lands Management

Continue to restore bottomland hardwood forests on approximately eight privately-owned Farmers Home Administration tracts. Also, initiate a Private Lands Program to support efforts to control feral hogs and sediments flowing onto refuge.

Discussion**:** Choctaw National Wildlife Refuge has acquired easements on about eight perpetual Farmers Home Administration (FmHA) conservation easements scattered through Sumter, Conecuh, and Monroe counties. These easements are distributed across four farms and add up to 236 acres. Both feral hogs and sediments are problems at the Choctaw Refuge, and neither can be resolved by treating the refuge in isolation, for wild swine and sediments readily move onto the refuge from adjoining lands.

Many national wildlife refuges have implemented private lands programs to address broader ecosystem and landscape issues, both problems and opportunities (like wetlands restoration and conservation corridors). Service authorities for involvement with private landowners in developing and carrying out habitat improvement projects are found in The National Wildlife Refuge System Improvement Act of 1997 and in the policy documents for the Service's Partners for Fish and Wildlife (PFW) Program. Additional authorities reside within the Fish and Wildlife Act and the Fish and Wildlife Coordination Act. Under the PFW Program, landowners may receive up to $25,000 for on-the-ground project implementation. PFW projects typically receive a minimum 50 percent in-kind cost share and require a minimum 10-year commitment from the landowner. Typically, landowner agreements are for more than 20 years.

The Farm Bill Conservation Programs, available through the U.S. Department of Agriculture under successive Farm Bills, provide significant opportunities for the development and implementation of habitat improvement projects on private lands. These programs include the Wetland Reserve Program, the Conservation Reserve Program, the Wildlife Habitat Incentives Program, and the Environmental Quality Incentives Program. Many millions of dollars are available to eligible private landowners for habitat conservation under these programs.

Strategies:

Visit each FmHA tract and its owner(s) at least once a year to note progress in habitat restoration and compliance with terms of the easement(s).

Consult with other national wildlife refuges that already have private lands programs in place to learn from their experiences.

Begin to meet with private landowners in the area either one-on-one or by inviting them to a group meeting where opportunities for cooperative land and resource management could be discussed, including funding opportunities and financial incentives for habitat management and restoration.

Work directly with local landowners on cooperative approaches to feral hog control, including experimenting with a variety of methods.

Educate neighboring landowners on the problems posed by sedimentation and feral swine not only for the refuge, but also for private and public landowners in general.

Objective C-3: Cultural Resources

Within 10 years of plan approval, develop and begin to implement a Cultural Resources Management Plan.

Discussion**:** Choctaw follows standard National Historic Preservation Act Section 106 procedures to protect the public's interest in preserving the cultural and historic legacy that may potentially occur on the refuge. Whenever construction work is undertaken that involves any excavation with heavy earth-moving equipment, such as tractors, graders and bulldozers used in the development of moist soil units, the refuge contracts with a qualified archaeologist or cultural resources expert to conduct an archaeological survey of the subject property. The results of this survey are submitted to the Service's Regional Historic Preservation Officer and the State Historic Preservation Office (SHPO), which, in Alabama, is a member of the Alabama Historical Commission. The State Historic preservation Officer reviews the surveys and determines whether cultural resources will be impacted, that is, whether any properties listed in or eligible for listing in the National Register of Historic Places

will be affected. If cultural resources are actually encountered during construction activities, the refuge is to notify the SHPO immediately. To date, no properties on the refuge have been determined to be eligible for the National Register of Historic Places.

Strategies:

Within 10 years of plan approval, conduct a Phase I archeological survey of the nonflooded areas of the refuge by qualified personnel, as a necessary first step in cultural resources management.

Conduct a Phase II investigation if archeological resources are identified during the Phase I survey. In this second phase, the eligibility of identified resources for listing on the National Register of Historic Places is evaluated prior to any disturbance.

Conduct a Phase III data recovery if the resources identified in Phases I and II are determined to be eligible. This will recover data and mitigate the adverse effects of any undertaking.

Within 15 years of plan approval, prepare a Cultural Resources Management Plan for the refuge.

Follow procedures outlined in Cultural Resources Management Plan for consultation with the Service's Regional Historic Preservation Office, the State Historic Preservation Office, and potentially interested American Indian tribes.

Follow procedures detailed in the Cultural Resources Management Plan for inadvertent discoveries of human remains.

Ensure archeological and cultural values are described, identified, and taken into consideration prior to implementing undertakings.

Develop a step-down plan for surveying lands to identify archeological resources and for developing a preservation program.

Objective C-4: Partnerships

Expand coordination with state and federal agencies to reduce and mitigate the effects of sedimentation on the refuge. Expand partnerships with the private sector on various issues of concern to the refuge. Form partnerships with various conservation organizations and private citizen-volunteers.

Discussion**:** The National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998 (Public Law 105-242) strengthens the Refuge System's role in developing effective partnerships with various community groups. Due to its remote location, small staff size (only one wildlife professional), lack of a visitor center, and the distance that separates the Choctaw Refuge from its office and headquarters, the refuge has not been able to establish partnerships with conservation and civic groups or the general public to the extent that other refuges have. However, the refuge does cooperate closely with the U.S. Army Corps of Engineers and the Alabama Division of Wildlife and Freshwater Fisheries on water, fisheries, and invasive vegetation management and control.

Strategies:

See Objective C-1 for strategies related to sedimentation.

Make a list of potential activities, projects, and programs amenable to participation or assistance by volunteers, with or without immediate supervision, such as habitat restoration projects; plantings; weed removal or control; construction and signing of nature trails; construction and maintenance of visitor-related facilities and interpretive exhibits; leading tours; and on- and off-site environmental education.

Via the news media, local organizations, and personal contacts, inform the public in the surrounding communities of the various opportunities for volunteering on the refuge.

Investigate opportunities for partnering with national, regional, and local nongovernmental organizations such as The Nature Conservancy, National Wildlife Federation, Ducks Unlimited, Wild Turkey Federation, Audubon Society, Boy Scouts, and Girl Scouts.

Once a loyal cadre of volunteers exists, look into the establishment of a Friends group that could raise awareness of the refuge and seek its own funding to carry out projects.

GOAL D – EDUCATION AND VISITOR SERVICES

Provide the public with opportunities for high quality wildlife-dependent recreation, environmental education, and interpretation that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge and throughout the National Wildlife Refuge System.

New visitor use facilities, proposed for construction and operation during the 15-year planning horizon, are displayed in Figure 6.

Objective D-1: Hunting

Allow limited hunting for deer, squirrel, rabbits, raccoons, and feral hogs during portions of state seasons. Within three years of plan approval, add a youth waterfowl hunt, contingent upon having the staffing resources or partners to manage the hunt.

Discussion: The National Wildlife Refuge System Improvement Act allows hunting as one of the preferred public uses of a national wildlife refuge as long as it is compatible with or does not adversely impact wildlife populations or the refuge's objectives or operations. Properly planned and administered hunts are an effective wildlife management tool and provide valuable recreation. They also often boost the local economy and enhance goodwill in the surrounding community.

At Choctaw National Wildlife Refuge, the majority of the areas open to hunting are only accessible by boat. Some hunters use bicycles for transportation once they access an area. Permits are required for hunting on the refuge. The front section of the refuge's hunting regulations brochure serves as both a hunting permit and an acknowledgement of refuge regulations.

White-tailed deer hunting is essential to maintaining a healthy herd and limiting its impact on habitat and forest regeneration. Choctaw National Wildlife Refuge currently allows archery hunting for deer. The refuge's relatively small size precludes the use of modern firearms. The available data suggest that current practices are adequately maintaining the herd in acceptable condition. In the future, consideration may be given to expanding deer hunting opportunities should conditions change. The primary focus of deer management on the refuge is to maintain a healthy, well-balanced herd and not to produce trophy animals. Deer hunters must report their take at one of two check stations located at the Womack Hill Work Center and Bobby's Fish Camp. Hunters are required to weigh the deer

(scales are provided) and remove and tag the jawbone (instructions are provided). The refuge staff estimates a 95 percent compliance rate for this requirement.

In the spring of 2002, a special two-day muzzleloader hunt for feral hogs was implemented. Hogs can also be taken incidentally when bow hunting for deer. Feral swine control should be a high priority on this refuge. Populations are high and, though variable at times, appear to be increasing overall. These animals cause tremendous damage to the natural habitats, reforestation efforts, and other refuge activities. Although public hunting by itself will not provide adequate control of this species, it should be used in conjunction with other management actions within administrative limits.

Small game hunting provides high quality recreation for many people and is provided on the refuge in the form of managed hunts for rabbits, squirrels, and raccoons. In general, the managed hunts do not cause significant biological impacts on populations of these species, so opportunities are limited only by potential effects on other refuge priorities and/or physical or administrative considerations. A primary purpose of Choctaw National Wildlife Refuge is to provide wintering habitat and sanctuary for waterfowl, which somewhat limits the amount of small game hunting that can be provided.

Waterfowl hunting is currently not allowed on the refuge. The relatively large size of the waterfowl sanctuary portion of the refuge would severely limit opportunities unless some or all of the sanctuary area was opened to hunting. Because the sanctuary areas in the general area are extremely limited and waterfowl populations on the refuge (and region) are generally not large, the current refuge sanctuary should be maintained. However, as a result of comments received during internal and external scoping, the Service has decided to add a limited youth waterfowl hunt on nonsanctuary portions of the refuge (probably the shop fields), contingent upon having staffing and/or volunteer resources to adequately manage the hunt.

All hunting activities at the Choctaw Refuge are currently hindered by a lack of authorized law enforcement personnel. The refuge currently has only one staff member (the Refuge Manager) with law enforcement authority. This situation prevents adequate law enforcement presence during hunts and places undue hardships upon the one individual. Additional enforcement personnel (ideally a biologist with some law enforcement authority would be preferred) would improve the situation markedly.

Strategies:

White-tailed Deer

Strive to maintain a well-balanced and healthy deer herd to prevent overpopulation and habitat destruction.

Maintain current levels of archery-only deer hunts.

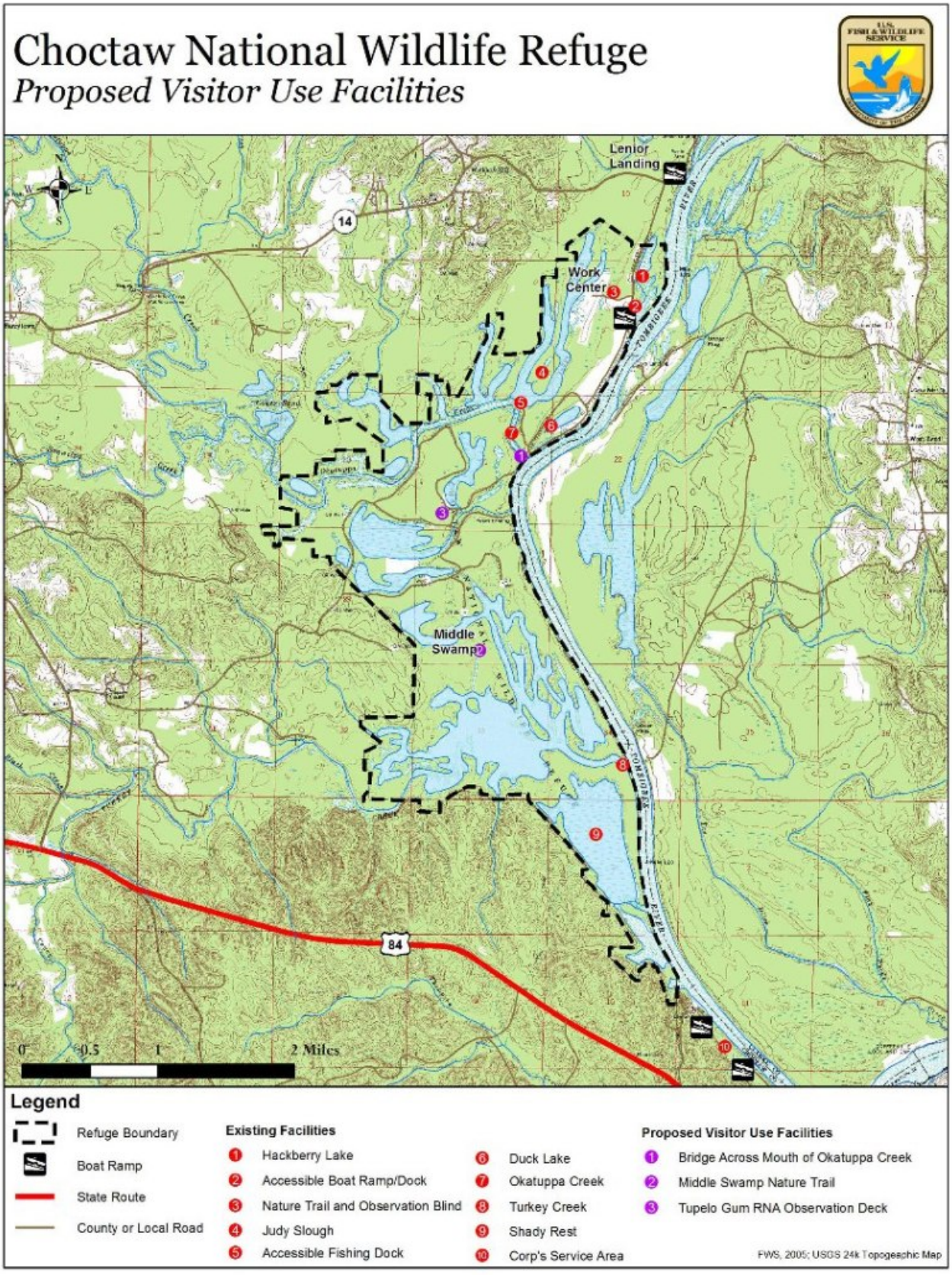
Work with state deer biologists to arrange for a herd health survey approximately every five years, or when signs of disease or poor health trigger the need for immediate sampling.

Collect age, sex, and general health data on samples of harvested deer to gauge overall herd condition.

Small Game

Continue current small game hunts to the extent there are no adverse impacts involving threatened and endangered species and migratory bird sanctuary needs. Limitations will be directed by public safety issues and the ability of the small staff to accomplish the priority biological and wildlife purposes of the refuge.

Figure 6. Proposed visitor use facilities at Choctaw National Wildlife Refuge



Open the area north of Okatuppa Creek for small game hunting.

Maintain current levels of permit-only hunting in selected areas of the refuge (consider expanding some hunts within the next five years if there are no impacts to migratory bird sanctuary needs and few impacts on limited staff time).

Review the night hunting of raccoons with dogs. Do not expand current seasons and limit hunt areas to minimize impacts to threatened and endangered species and to migratory bird resting, nesting, and sanctuary areas. These hunts should be limited by setting permit limits on the number of hunters and number of hunts.

Feral Hogs

Use public hunting and contract trapping/hunting to reduce populations of feral swine.

Maintain the current archery and muzzleloader hunts and investigate opportunities to increase or expand hunts for feral swine.

Determine the feasibility of contract trapping/hunting to control problem wildlife (e.g. swine, coyotes, beaver). Trapping for biological purposes should be maintained as an option on the refuge.

Youth Waterfowl Hunt

Evaluate and designate a youth waterfowl hunting site.

Coordinate with the state and interested organizations and individuals.

General Hunting

Maintain a high level of quality (no overcrowding) and safety in all public hunting activities.

Add one full-time employee with law enforcement authority.

Maintain the current waterfowl/migratory bird sanctuary areas and limit hunting and fishing-associated disturbance in these areas.

Expand closure periods to include December through February (none or very limited use of motorized boats, all-terrain vehicles [ATVs], and shooting of firearms).

When revising the hunting brochure, provide a scale for the map and show the location of Bobby's Fish Camp.

Build a new hunter check station at the work center (possible at Bobby's Fish Camp) and provide updated information.

Objective D-2: Fishing

Within five years of plan approval, build new fishing facilities such as a universally accessible fishing pier; provide additional woody fish structure within the reservoir; and improve boating access via stump removal and increased aquatic vegetation control.

Discussion: Fishing is the major recreational activity at the refuge, with approximately 21,000 fishing visits annually. The refuge must promote and permit fishing only to the extent that it does not interfere with the waterfowl purpose of the refuge. There is a two-lane boat launching area located across from the Womack Hill Work Center that receives heavy use. The gravel parking area will accommodate up to 20 vehicle and trailer rigs, with overflow parking taking place in a grassy area along the roadway. Off-refuge launching sites include Bobby's Fish Camp and the Corps of Engineers' Service Park, both of which charge a $3.00 launch fee; and Lenoir Landing, another Corps facility that does not charge a fee. There is no charge to launch at the refuge's boat ramp.

Bank fishing is also popular, especially at the mouth of Okatuppa and Turkey creeks and Judy Slough. A fishing pier located in Judy Slough receives heavy use. However, the pier is sometimes blocked by an abundance of aquatic weeds and debris from high water. Litter is an ongoing major problem at each of these areas, as well as others within the refuge.

A fishing and boating brochure is available at several locations (Choctaw National Wildlife Refuge n.d.c). It includes a map and lists special fishing regulations, including information on closed areas, boat launch sites, safety hazards, and accessibility, as well as a fishing calendar.

Commercial fishing takes place on a small scale with only two permits issued in 2003.

Strategies:

Conduct/prioritize invasive aquatic plant control in areas that will allow better access to anglers (i.e., Judy Slough; the slough in front of the maintenance building; and Turkey Creek).

Working with the Corps, provide additional woody fish structure by downing selected trees along the riverbank and slough banks.

Determine if there are areas in winter (backwater areas) where some public fishing can take place without disturbance to migratory bird sanctuary areas.

Work with the Corps and the state to ensure no degradation of fishing values due to contaminants, excessive siltation, or loss of overall water quality.

Engage the Corps as a full partner in helping to meet refuge goals for fisheries, invasive plant control, and water level management.

Periodically reevaluate commercial fishing on the refuge and terminate within five years if it is determined not to be appropriate and compatible.

If allowed by the refuge, provide commercial fishing by random permits and limit the number of commercial fishing permits to a maximum of two per year.

When revising the refuge's fishing and boating brochure, provide a scale bar on the map.

Place signs in bank fishing areas that say, "This area may be closed if littering continues." If necessary, close an area and put up a sign stating, "This area closed due to excessive littering."

Objective D-3: Wildlife Observation and Photography

Within one year of plan approval, complete existing interpretive trail behind existing observation deck at moist soil units; add interpretive panels; and manage the moist soil units in front of the observation deck to increase visitor viewing opportunities. Within seven years of plan approval, add an observation deck at the Tupelo Gum Research Natural Area, contingent upon bridge construction. Within 15 years of plan approval, build a bridge over the mouth of Okatuppa Creek to facilitate access to Middle Swamp and develop a 2–3-mile nature trail in Middle Swamp.

Discussion: Choctaw maintains a 2 ¾-mile multipurpose driving area. This road system, while not a designated wildlife auto drive, nonetheless provides visitor access to boat ramps, key bank fishing locations, and wildlife viewing opportunities. Figures 5 and 6 show the existing and proposed visitor use facilities on the refuge.

The refuge's main entrance has an overlook and kiosk. The overlook gives refuge visitors a view of a habitat that was historically a highly active wading bird rookery. While the rookery has since moved, wildlife viewing continues with other waterfowl, alligators, and nonnesting wading birds using this site.

The refuge has an observation blind located along a ¾-mile unimproved nature trail. It is used primarily during the winter months by wildlife observers and photographers when waterfowl are present. Informational placards mounted on posts are offered along the nature trail and at the entrance of the observation blind; they provide wildlife and plant facts to visitors. Presently, the nature trail and observation blind area is used by both wildlife observers and hunters throughout the year. Refuge management will address this potential conflict if wildlife observation and photography increase along the nature trail or at the wildlife observation blind.

Wildlife observation tours are given upon request to visiting Audubon Society members from Birmingham and Mobile. Tours are led by refuge staff and include key terrestrial viewing locations and boat tours to view waterfowl and bald eagle nesting sites.

Strategies:

Overlook

Maintain existing entrance overlook clear of underbrush to increase viewing area.

Extend the sidewalk the length of the fence at the overlook area (and possibly add a second bench).

Existing Nature Trail and Observation Platform

Install a "nature trail and wildlife observation platform" sign at the start of the existing nature trail.

Highlight the nature trail and observation platform in the general brochure.

Develop a trailhead information panel that informs visitors of the length of the trail; the trail's condition; some "do's and don'ts;" and safety precautions.

Place a bench at the halfway point of the nature trail.

Make the trail accessible possibly by building a boardwalk.

Manage the habitat in front of the observation platform to increase wildlife viewing opportunities.

Develop custom interpretive panels more specific to the Choctaw Refuge along the trail.

Consider closing the area to hunting as other uses increase.

Middle Swamp

Build a bridge across Okatuppa Creek to open the Middle Swamp to the nonboating public.

Provide directional signs on the roads in the Middle Swamp area.

Develop a 2–3-mile nature trail in the Middle Swamp area.

Tupelo Gum Research Natural Area

Install a bench and interpretive kiosk at the tupelo/cypress swamp area; or as use increases, develop a boardwalk and observation deck that extends a short distance into the swamp area.

Wildlife Observation Tours

Continue to provide wildlife observation tours upon request.

Objective D-4: Environmental Education and Interpretation

Over the life of the plan, expand environmental education and interpretation by enhancing interpretation on the existing trail; design and install interpretive displays on new trail(s); and update the kiosk with standard interpretive panels. Expand use of volunteers in environmental education.

Discussion**:** Choctaw National Wildlife Refuge does not have a staff member designated to develop an environmental education program. Due to staff size and expertise and because of the location of the refuge in relation to the refuge headquarters, the staff has not developed any type of environmental education program at the refuge.

The refuge staff responds to occasional requests from Scout groups, local schools, and civic groups for presentations in the surrounding community. The refuge also participates in Forest Awareness Week Now presentations. These requests occur about twice a year.

No environmental education program has been given on site in four years, nor has there been a request to provide such an event. Four high schools and two elementary schools are in the general area of the refuge; however, these numbers are subject to change due to potential school closings. The schools do not request staff-guided field trips to the refuge, and the refuge staff has not done any outreach to local teachers.

The refuge provides information to visitors on the Internet, in the general brochure, at the entrance overlook kiosk, and on small interpretive panels at the overlook and on the nature trail. The messages on the panels include information on the refuge's habitat and species diversity, the National Wildlife Refuge System, and other standard "off the shelf" materials. The refuge staff occasionally provides guided tours to special groups (e.g. birders) on request. However, the staff is not available to provide regularly scheduled interpretive programs, nor is there a demand for this type of program.

A small table-top exhibit about the refuge is provided in the reception area of the headquarters office in Jackson, Alabama, some 45 minutes by car from the refuge.

Strategies:

Continue to work with the Boy Scouts and Forest Awareness Week Now.

Send a letter to teachers at the closest schools to let them know about the refuge.

Contract with a teacher to develop a wood duck activity kit that teachers can use in their classroom.

Explore opportunities to use interns, college students, part-time hires, contractors, and volunteers to develop educational materials for teachers.

Efforts should be aimed mostly toward materials and activities that teachers and group leaders can use in the classroom, rather than toward field trip experiences.

When hiring the next full-time staff person, consider including visitor services as a collateral duty.

Install custom interpretive panels at the entrance overlook to replace the existing "off the shelf" panels.

Install custom interpretive panels along the nature trail.

Install custom interpretive panels in the observation building.

Install an interpretive panel at the tupelo-cypress area in Middle Swamp.

Consider the following interpretive themes in all exhibits and materials:

- -wood ducks
- -eagles and wood storks (threatened/endangered species)
- -management and farming
- -minimizing impact of oil and gas activities on national wildlife refuges
- -bottomland hardwoods (importance and current status in region)
- -neotropical migrants
- -impact of invasive plants and animals, and need for control of these species
- -cultural history of the area

GOAL E – REFUGE ADMINISTRATION

Provide for sufficient staffing, facilities, and infrastructure to implement a comprehensive refuge management program to protect and manage the natural and cultural values of the refuge's bottomland hardwood system to fulfill the refuge's purposes, goals, and objectives.

Objective E-1: Staffing

Within five years of plan approval, augment the refuge staff by a minimum of two full-time equivalent (FTE) positions that would include an Assistant Refuge Manager, a wildlife biologist, and/or a

forester. At least one of the new staff persons would have law enforcement and/or visitor services as collateral duty.

Discussion**:** At present, the Choctaw Refuge's wildlife and visitor management efforts are severely hampered by persistent staffing shortages. The current and proposed organizational charts are shown in Chapter V (Figures 7 and 8).

Strategies:

Add one FTE wildlife biologist with forest management experience, or a forester with wildlife management experience to the refuge staff to implement the Forest Management Plan and related wildlife habitat improvement projects.

Add one FTE with law enforcement authority.

When hiring a new FTE staff person, include visitor services as a collateral duty.

Share a forester with a nearby national wildlife refuge.

V. Plan Implementation

INTRODUCTION

This comprehensive conservation plan outlines an ambitious course of action for the management of Choctaw National Wildlife Refuge over the next 15 years. The ability to enhance wildlife habitats on the refuge at the same time as expanding its recreational opportunities will require the dedicated commitment of staff and adequate funding from Congress and the Service. Consequently, the refuge will continually need appropriate operational and maintenance funding to implement the objectives in this plan. To continue to make progress, the refuge will seek additional venues for staffing and funding, such as partners, volunteers, and grants.

PROJECT SUMMARIES

The following provides a brief description of the highest priority refuge projects (Tier 1), as chosen by the refuge staff and listed in the Service's Refuge Operating Needs System (RONS).

WILDLIFE AND HABITAT MANAGEMENT

Intensifying Management of Moist Soil Units and Farm Fields $76,000

Improve the refuge's ability to enhance wildlife habitat on moist soil units and cooperatively farmed fields through increased water pumping and habitat manipulations. Home to a wide variety of wildlife, Choctaw National Wildlife Refuge provides especially valuable migratory bird habitat with thousands of wintering waterfowl using the refuge's backwaters and managed wetlands, including an important population of wood ducks.

RESOURCE PROTECTION

Controlling Invasive Plant Species $128,000

Control invasive exotic plant species such as alligator weed, water hyacinth, and hydrilla. These exotic plants are destroying native habitats, severely impacting wildlife populations and diversity. Weed control will create openings in the wetlands for wildlife use and provide easier access by thousands of fishermen and other visitors. This growing problem will require intensive management by a biological science technician provided by this project. Plant control would be accomplished in partnership with the U.S. Army Corps of Engineers and others through a multipronged, integrated approach using mechanical, chemical, and biological (alligator weed flea beetle) control methods, as well as public outreach measures.

EDUCATION AND VISITOR SERVICES

Expanding Public Use and Other Programs $139,000

Provide an Assistant Refuge Manager to expand the refuge's public use programs; support other programs in cooperative farming, reforestation, wildlife monitoring, and wetland management; and develop a prescribed burning and wildfire suppression initiative. The refuge currently has only four staff members, and none of these positions is dedicated to public use. This project is essential in meeting the needs of a growing number of refuge visitors, and would also enhance the refuge's overall resource management programs for a wide variety of fish and wildlife.

REFUGE ADMINISTRATION

Augmenting Staff Capacity $139,000

Provide a wildlife biologist at the Choctaw Refuge to obtain and evaluate critical habitat and wildlife surveys. The refuge does not have (and has never had) a biologist, and the biological information needed to help make the most informed management decisions is not being obtained. This project will result in the gathering of essential data—which are currently nonexistent—to enable sound management of the full spectrum of refuge resources.

OTHER RONS PROJECTS

In addition to the above high-priority, Tier 1 projects, Choctaw National Wildlife Refuge has a list of 10 other RONS projects that, if funded and implemented, would pursue the goals and objectives outlined in this comprehensive conservation plan. These projects are summarized in Table 12.

Table 12. Additional RONS projects at Choctaw National Wildlife Refuge

Station Rank	Project Number	Project Title	Cost Estimate
1	00001	ERADICATE AND CONTROL INVASIVE PLANTS	$64,000
2	03001	Protect refuge resources and visitors	$136,000
3	00004	Improve moist soil management capabilities	$60,000
4	00003	Improve wood duck banding operations	$50,000
5	97001	Determine cause and remedy for wood duck nest box predation	$25,000
6	00002	Increase public outreach activities	$67,500
7	00006	Provide public outreach opportunities	$109,000
8	98007	Complete environmental compliance audit	$34,000
9	00007	Protect bottomland hardwoods	$108,000
10	97011	Protect archeological resources	$125,000

STAFFING AND FUNDING

In the preceding chapters, the Choctaw National Wildlife Refuge Comprehensive Conservation Plan has outlined a vision for the refuge and included the management goals, objectives and strategies needed to realize the vision. Without ongoing help from partners and volunteers, the current level of refuge funding will not likely be able to prevent a slow deterioration of the current habitat conditions and the quality of public use opportunities on the refuge. Pre-plan staff levels do not allow adequate interaction with the public for education, interpretation, information, safety, or enforcement purposes. In addition, habitat management objectives and strategies are not achievable with the current staffing. The rate at which the refuge achieves its full potential of contributing to locally, regionally, and nationally important wildlife programs will depend on the resources provided for those purposes. Increased staffing and funding for the refuge will result in long-lasting conservation, maintenance, and enhancement of bottomland forests, moist soil habitats, aquatic habitats, wetlands, and public use facilities and programs.

Implementing the vision set forth in this plan will require additions to the refuge's organizational structure. The existing staff will direct their time and energy in new directions, and two new staff members will be added to assist these efforts. The Tier 1 RONS items described above involve obtaining new staff to carry out the expanded responsibilities. The following table and organizational charts identify the additional positions and future structure of the refuge. A total of 2.0 FTEs would be needed to fully implement the comprehensive conservation plan.

Table 13. Additional staff identified to implement the comprehensive conservation plan for Choctaw National Wildlife Refuge

Position	Full-time Equivalent (FTEs)	Funding required
Assistant Refuge Manager	1.0	$139,000
Wildlife Biologist	1.0	$139,000
TOTAL FTEs	**2.0**	**$278,000**

Figure 7 shows a current staffing chart for the refuge. Figure 8 shows the proposed staffing chart, which includes the above positions.

Figure 7. Choctaw National Wildlife Refuge current staffing chart

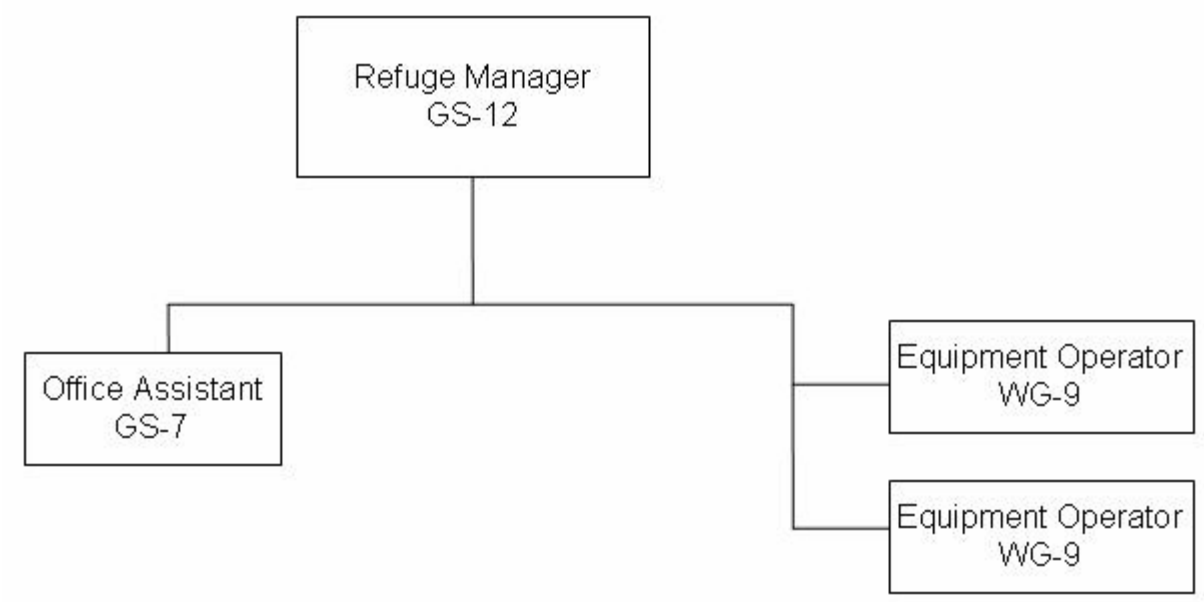
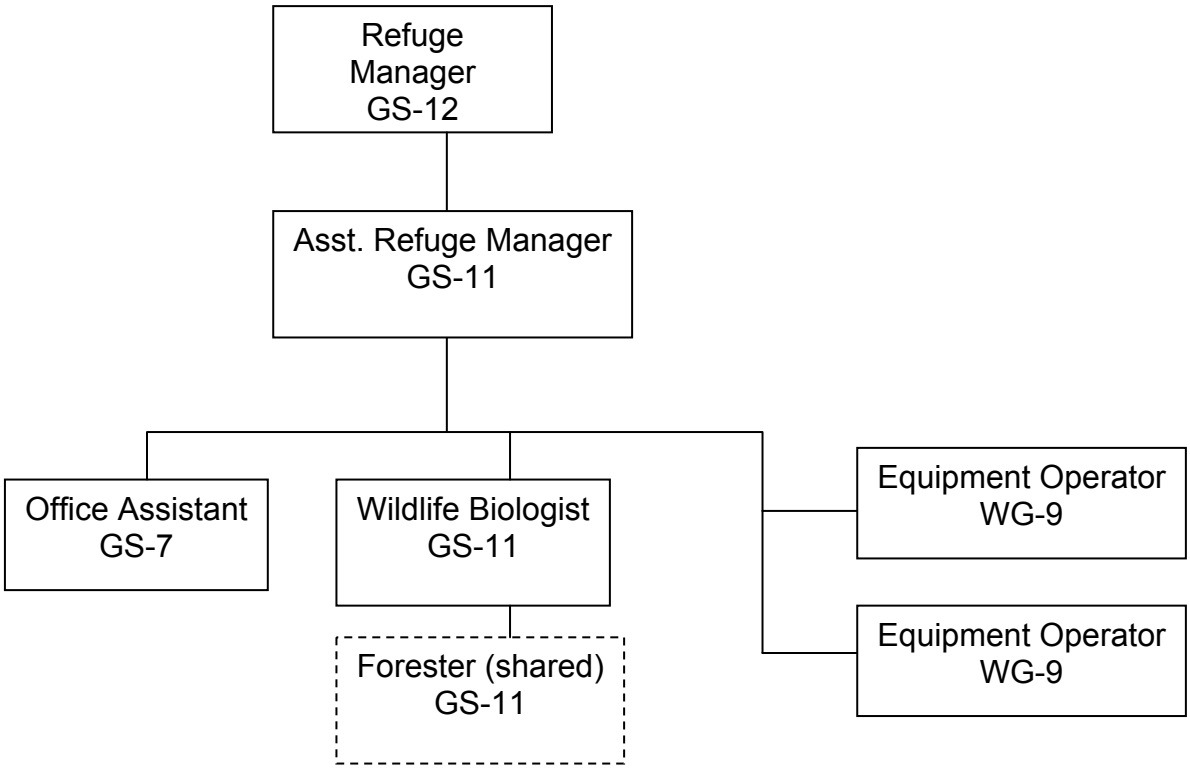


Figure 8. Choctaw National Wildlife Refuge proposed staffing chart



PARTNERSHIP OPPORTUNITIES

Partnerships are essential for the successful pursuit of Choctaw National Wildlife Refuge's goals, objectives, and strategies. Indeed, the refuge already cooperates with several organizations and individuals on important projects, including other agencies like the U.S. Army Corps of Engineers, Alabama Division of Wildlife and Freshwater Fisheries, and nongovernmental conservation groups such as The Nature Conservancy. In addition, the refuge has partnered with and will continue to partner with local police and volunteer fire departments; nonprofit conservation organizations such as the Audubon Society and Ducks Unlimited; broad conservation initiatives such as the Lower Mississippi Valley Joint Venture Area and Partners In Flight; and last but not least, many private individuals. Further, this Draft Comprehensive Conservation Plan supports the Partners-in-Flight Initiative; North American Waterfowl Management Plan; U.S. Shorebird and Wading Bird plans; the Central Gulf Coast Ecosystem Plan; Partners for Amphibian and Reptile Conservation; and the American Woodcock Management Plan.

If the staff can be expanded to allow time for more outreach to local communities, there may be opportunities to involve individual volunteers with the refuge. Properly supervised and directed, these volunteers could make a valuable contribution to the refuge by assisting the staff with any number of activities, including habitat improvement projects (e.g., planting native species and removing invasive vegetation), projects to monitor habitat and wildlife populations, and environmental education both on and off the refuge.

Many national wildlife refuges have partnering nonprofit organizations, often called Friends groups, which serve as advocates and assistants for a refuge. These civic associations have the ability to reach out to the surrounding community for assistance on refuge projects and for local support on conservation issues. Due to several factors, including the isolation of the Choctaw Refuge, the physical separation of the refuge from its headquarters and office, the low surrounding population, poverty, and insufficient refuge staffing to nurture such an effort, no Friends group has ever been developed for the refuge. During the public scoping meeting, however, some interest was suggested on the part of the public for the creation of such a group for Choctaw National Wildlife Refuge.

The goals and objectives outlined in this plan need the support and the partnerships of federal, state, and local agencies; nongovernmental organizations; and private citizens. This broad-based approach to managing fish and wildlife resources extends beyond social and political boundaries and requires a foundation of support from many. The refuge will continue to seek creative partnership opportunities to achieve its vision for the future.

STEP-DOWN MANAGEMENT PLANS

Several step-down management plans describe specific actions that support the accomplishment of refuge objectives. The step-down plans identified in Table 14 will be reviewed and revised as necessary to achieve the results anticipated in this comprehensive conservation plan.

Table 14. Step-down management plans

Plan	Date Completed	Anticipated Revision
Forest Management Plan	1987	2008
Oil and Hazardous Substances		2012
Contingency Plan	1988	2010
Hunting Plan	1982	2007
Cropland Management Plan	1995	2010
Moist Soil Unit Water Management Plan		2012
Fire Management Plan	2001	2011
Law Enforcement Management Plan	1992	2009
Public Use Development Plan	1986	2006
Fishery Management Plan	1982/93	2006
Wildlife Inventory Plan	Date unknown	2010
Invasive Species Plan		2010
Visitor Services Plan		2010
Cultural Resources Management Plan		2020

MONITORING AND ADAPTIVE MANAGEMENT

Adaptive resource management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs, that is, by monitoring and adapting them.

The direction set forth in this comprehensive conservation plan, plus specifically identified strategies and projects, will be monitored throughout the life of this plan. The Service will adjust its management programs as new information and research become available. Furthermore, on a periodic basis, the Service's Southeast Regional Office will assemble a station review team whose purpose will be to visit the refuge and evaluate its current activities in light of this plan. The team will review all aspects of refuge management, including direction, accomplishments, and funding. The

goals and objectives presented in this plan will provide the baseline from which this field station review will be evaluated.

PLAN REVIEW AND REVISION

This Comprehensive Conservation Plan for Choctaw National Wildlife Refuge is meant to provide guidance to refuge management and staff over the coming 15 years. However, the plan is also a dynamic and flexible document, and some of the strategies it contains are subject to unpredictable phenomena such as droughts, floods, windstorms, hurricanes, and other uncontrollable natural events. In addition, other strategies may be subject to new research and new information that may direct changes or new objectives, strategies, and projects. Likewise, many of the strategies are dependent upon Service funding for staff and projects. Because of all these factors, the objectives, strategies, and recommendations in this plan will be reviewed periodically and, if necessary, will be revised to meet new circumstances. A new or updated comprehensive conservation plan is anticipated to be developed by the end of the 15-year life of this plan.

SECTION B. DRAFT ENVIRONMENTAL ASSESSMENT

I. Background

INTRODUCTION

This Draft Environmental Assessment for Choctaw National Wildlife Refuge was prepared in compliance with the National Environmental Policy Act of 1969. It discusses the purpose and need for the refuge's comprehensive conservation plan, and provides an analysis of the impacts that could be expected from each of the management proposals outlined in the plan. This analysis assists the Service in determining if it will need to prepare an environmental impact statement or a finding of no significant impact for the plan.

PURPOSE AND NEED FOR ACTION

The purpose of the comprehensive conservation plan is to establish and implement a management direction for Choctaw National Wildlife Refuge over the next 15 years. This management direction is specified in detail through a vision statement and a set of goals, objectives, and strategies, which are described in Chapter IV of the Draft Comprehensive Conservation Plan (Section A).

The action is needed because adequate, long-term management direction does not exist for the refuge. Management is currently guided by a combination of general policies, specific step-down plans, and broad wildlife management principles that are in need of revision based on new laws, policies, and the mission of the National Wildlife Refuge System. The action is also needed to address the current management issues at Choctaw National Wildlife Refuge and to satisfy the legislative mandates of the National Wildlife Refuge System Improvement Act of 1997, which requires the preparation of a comprehensive conservation plan for all refuges by the year 2012.

DECISIONS TO BE MADE

The Service's Southeast Regional Director will need to make two decisions based on this environmental assessment: (1) select an alternative, and (2) determine if the selected alternative is a major federal action that significantly affects the quality of the human environment, thus requiring preparation of an environmental impact statement. The planning team has recommended Alternative D as the preferred alternative to the Regional Director. The recommendation was based on an evaluation of the purposes for which Choctaw National Wildlife Refuge was established; the goals of the refuge; the missions of the Service and the National Wildlife Refuge System; and other legal mandates and pertinent plans. The Draft Comprehensive Conservation Plan (Section A) has been developed for implementation based on this recommendation. Assuming that no significant impacts are found, implementation of the plan will begin, and the plan will be monitored on an annual basis and revised when necessary, typically every five years. This plan will guide the management of the refuge for the next 15 years and serve as the foundation for all future planning efforts.

PLANNING STUDY AREA

The planning study area for this environmental assessment includes Choctaw National Wildlife Refuge in Choctaw County, Alabama, and eight perpetual Farmers Home Administration conservation easements managed by the refuge in Sumter, Conecuh, and Monroe counties in southwestern Alabama. These easements total 236 acres. The refuge itself encompasses 4,218 acres.

The refuge was originally acquired as part of the U.S. Army Corps of Engineers' Coffeeville Lock and Dam project on the Tombigbee River. In January 1964, the Department of the Interior and the U.S. Fish and Wildlife Service acquired the management rights in perpetuity from the Corps and began refuge management practices. However, the Corps continues to retain fee simple title to the property on which the refuge is located. This environmental assessment addresses the management of these refuge lands, as well as efforts to work with owners of nearby lands which affect the refuge.

PLANNING PROCESS AND ISSUE IDENTIFICATION

THE PLANNING PROCESS

In preparing for the development of this comprehensive conservation plan, a team of wildlife and plant biologists, foresters, and other specialists from the Service and the Alabama Division of Wildlife and Freshwater Fisheries conducted a wildlife and habitat (biological) review, which was completed in the spring of 2002 (Choctaw National Wildlife Refuge 2002b).

Initial planning began in March 2004 with a meeting of the planning team members. Early in the planning process, the planning team identified a list of issues and concerns that were likely to be associated with the conservation and management of Choctaw National Wildlife Refuge. The team also prepared a preliminary schedule and plans for public involvement.

In addition, a visitor services review was conducted to contribute information to the planning team on the refuge's visitor use, environmental education, and outreach programs. This visitor services review was completed in May 2004 (Choctaw National Wildlife Refuge 2004).

Formal public involvement began with a public scoping meeting and open house in June 2004, through which interested citizens and stakeholders were able to register their comments, concerns, and suggestions. The meeting was advertised through public announcements and mailings giving the location, date, and time. These were sent to individuals on the mailing list and to the local newspaper and radio station. The comments and suggestions obtained from this meeting were considered in developing this draft plan. Please refer to Chapter III, Plan Development, of the Draft Comprehensive Conservation Plan (Section A) for more details on the planning process and the scoping of issues.

The planning team reviewed the results of this internal and external scoping and used them, along with the outlined goals, objectives, and strategies, to develop four different management alternatives for the refuge. The four alternatives are presented and evaluated in this environmental assessment, and the preferred alternative forms the basis of the comprehensive conservation plan itself. The Draft Comprehensive Conservation Plan and Environmental Assessment is being released to the public for review and comment. The Service will examine all comments and suggestions received, and decide whether revisions or changes to the plan are in order.

ISSUES AND CONCERNS

A variety of issues, concerns and opportunities were addressed during the planning process. Discussions among private citizens, local residents, resource specialists, the refuge planning staff, and other Service staff brought to light various recurring themes. In general, themes centered on creating a balanced public use program; providing migratory bird management; ensuring water quality, including the management of watershed activities; controlling pest and invasive species; addressing hunting and fishing; restoring interior forest habitats; and addressing the lack of staff and

facilities. Some of the issues raised during internal and public scoping included:

- Addressing invasive aquatic vegetation encroachment.
- Managing forests to achieve beneficial changes in forest structure, particularly improvements in understory and midstory conditions.
- Updating the forest inventory.
- Adding law enforcement staff.
- Improving the documentation of long-term changes in refuge habitats.
- Controlling feral swine.
- Monitoring water quality and environmental contaminants.
- Continuing support for wood duck breeding in the form of maintained nest boxes.
- Providing adequate protection for threatened and endangered species and species of concern.
- Cooperating with the U.S. Army Corps of Engineers and the Alabama Division of Wildlife and Freshwater Fisheries in fisheries management.
- Increasing management for shorebirds and wading birds.
- Providing management for the American woodcock, which has not been documented on the refuge but which could benefit from proposed forest openings.
- Conserving neotropical migrants and other nongame forest birds.
- Providing opportunities for increasing hunts permitted on the refuge, such as duck hunting and a spring wild turkey hunt.
- Addressing the declining quality of the angling experience, both from reduced catch and increasingly restricted access from the spread of invasive aquatic vegetation.
- Addressing the overall staffing shortages at the refuge, which severely limit active management of habitat, wildlife, and public use.
- Expanding the involvement of volunteers and community groups with the refuge.

A complete listing and further discussion of these issues and concerns are provided in Chapter III, Plan Development, of the Draft Comprehensive Conservation Plan (Section A).

II. Affected Environment

Please refer to Chapter II, Refuge Description, of the Draft Comprehensive Conservation Plan (Section A) for detailed information on the environment of Choctaw National Wildlife Refuge.

III. Alternatives

FORMULATION OF ALTERNATIVES

Alternatives are different approaches or combinations of management objectives and strategies designed to achieve the refuge's purposes and vision; the goals of the National Wildlife Refuge System; the mission of the U.S. Fish and Wildlife Service; and the priorities and goals of the Central Gulf Coast Ecosystem. Four management alternatives were developed by the planning team, based on the issues, concerns, and opportunities that were identified by the Service and the public during the scoping process. The four alternatives evaluated in full through this environmental assessment are:

- Alternative A. Current Management Direction (No Action)
- Alternative B. Enhanced Wildlife/Fisheries and Habitat Management
- Alternative C. Enhanced Wildlife-dependent Recreation
- Alternative D. Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)

Alternative D, Enhanced Wildlife/Fisheries, Habitat, and Public Use, is the Service's preferred alternative for managing Choctaw National Wildlife Refuge. This alternative strives for a balanced approach to the key issues and refuge mandates, while maintaining the needs of wildlife first. It is designed to provide a balance of appropriate and compatible wildlife-dependent recreational opportunities, while optimizing habitat management for the restoration and protection of the refuge's biological diversity.

The specific impacts of implementing each of the four management alternatives were examined in eight broad issue categories, as follows:

Migratory Birds: How will the refuge provide the complex of habitats needed to maintain the current diversity of migratory bird species, while providing for other more imperiled migrants? How will the refuge meet the habitat objectives identified in support of national and regional plans? How will the refuge monitor population responses to habitat programs? Are there inevitable tradeoffs between managing for different groups of migratory birds? Can "win-win" management approaches be developed?

Habitat: What level of habitat restoration and maintenance is appropriate given desired future conditions? What diversity and quantity of habitats is needed to meet the objectives in support of refuge purposes and national and regional plans?

Other Fish, Wildlife, and Plants: How will the refuge provide for the critical habitat needs of resident wildlife dependent on refuge resources? Will the proposed management scenario benefit natural biodiversity? How will the refuge provide for the needs of resident birds, mammals, amphibians, reptiles, and fish, while recognizing that the refuge's purposes emphasize migratory birds?

Visitor Services and Recreation: What is the appropriate level of recreational activities on the refuge? Does the refuge adequately meet the mandate to provide appropriate and compatible high quality wildlife-dependent recreation? How will the refuge create a more balanced program that could potentially accommodate all six public priority public uses, as long as they are appropriate and compatible? How will the refuge ensure that all visitors are aware of the purposes and mission of the refuge and the National Wildlife Refuge System?

Resource Threats: What aspects of surrounding land uses threaten the integrity of the refuge's ecological processes? What can the refuge do to control or reduce these adverse impacts?

Land Protection: Can the refuge play a larger role in resource conservation in the Central Gulf Coast Ecosystem?

Refuge Administration: What levels of staff, funding, and facilities will be needed to meet the refuge's goals and objectives? What is the impact on facilities of a given management alternative?

Other Human Dimensions: What will be the socioeconomic gains and loses to local communities by implementing the proposed management alternatives? How can the refuge build strong, sustainable partnerships with other federal, state, and local government agencies; private citizens; adjacent and nearby landowners; and nongovernmental organizations?

DESCRIPTION OF ALTERNATIVES

ALTERNATIVE A: CURRENT MANAGEMENT DIRECTION (NO ACTION)

This is the "status quo" alternative. Under this alternative, no action would be taken to improve or enhance the refuge's current habitat, wildlife, and public use management programs. The existing programs would be continued with no changes.

The refuge has a current Forest Management Plan, but it has not been fully implemented. Some stand treatments have been applied, but secondary treatments (thinnings) have not. Regeneration is occurring on the forest floor, but not stand recruitment; saplings are not maturing due to being eaten by deer and feral swine, or to inhibited growth by frequent flooding and shady conditions. A dense canopy inhibits the regeneration of all but the most shade-tolerant trees. While mast production is good at present, it will probably decrease over the long term as oaks become over-mature and are not replaced by younger, more vigorous and productive oaks.

The refuge's backwaters, sloughs, and wetlands are gradually filling in with sediments, a natural process that is being exacerbated by periods of flooding and prolonged high water from the operation of the Coffeeville Lock and Dam. This long-term sedimentation problem would continue unchanged under this alternative.

Major infestations of invasive aquatic plants such as hydrilla, alligator weed, and water hyacinth are currently occurring in virtually all of the refuge's water bodies. These invasive weeds—most of them nonnatives—are displacing native aquatic and wetland plants, degrading fish habitat, trapping additional sediments, and reducing dissolved oxygen. The infestations are also choking the refuge's backwaters, sloughs, and creeks, making them inaccessible to boats and anglers. At present, 75 acres of backwater slough emergents per year are treated with herbicides, and this would continue under this alternative. To a lesser extent, biological controls would also continue to be used.

Cogongrass, an invasive exotic (nonnative) terrestrial plant, and feral swine, an exotic animal, would continue to be the focus of management control efforts under this alternative. Cogongrass is sprayed annually, and feral hogs are allowed to be taken as an incidental species during the refuge's deer and small game hunts. The refuge staff also conducts limited trapping of feral hogs. A recent reduction in the refuge's feral hog population appears to be due to off-refuge trapping by one or more neighboring landowners. Under this alternative, limited trapping and incidental hunting of feral hogs would be continued.

The refuge is actively managing habitat for migratory birds through force-account farming (35 acres) and moist soil management (15 acres). Under this alternative, these acreages would not change. The refuge is also fostering the production of wood ducks by providing 400 nest boxes, and cleaning them once annually. The staff monitors the wood duck nest boxes and collects nesting data. This level of wood duck management would be continued under this alternative.

Two federally listed species—the bald eagle and the wood stork—are currently documented on the refuge. The refuge's two active bald eagle nests are protected by sanctuaries (closed areas) that restrict public access by boaters, anglers, hunters, and other visitors. Wood storks are observed occasionally on the refuge during the summer; this is a population that nests in Florida and migrates north after the nesting season.

With regard to resource protection, the U.S. Army Corps of Engineers has limited funds for dredging areas of the refuge that have been filling in with sediments. The refuge's contaminant surveys are now out of date, and no complete surveys have ever been conducted. Oil and gas rights on the refuge are outstanding, and production on the refuge requires communication and cooperation with the oil and gas companies to reduce above-ground impacts and disturbance, as well as to avoid, minimize, and mitigate spills and contamination.

Fishing is the refuge's principal public use. Both bank and boat fishing are available. The public has expressed concerns about the declining quality of the fishing experience, mainly because of degraded aquatic habitat and reduced access to fishing areas that have been rendered impenetrable from invasive weedy vegetation. Periodic creel and angler surveys are conducted by the Alabama Division of Wildlife and Freshwater Fisheries.

Hunting and wildlife observation are secondary public uses on the refuge. A wildlife observation platform is provided next to the moist soil units, with a 0.5-mile loop interpretive trail nearby. Other forest roads permit foot travel, but access is generally difficult with most areas accessible only by boat. Current refuge hunts include an archery hunt for deer and a small game season for squirrels, rabbits, and raccoons. There is no waterfowl hunting. Feral hogs are considered an incidental species and can be taken during all refuge hunts. Under this alternative, the same public access and public uses would continue; access to many areas would remain only by boat from the reservoir.

The refuge staff is currently working with private landowners to restore bottomland hardwood forests—through the planting of oak trees—on eight Farmers Home Administration easement tracts.

The refuge's physical isolation from its headquarters office in Jackson, Alabama (a driving distance of 45 minutes by car) inhibits hands-on refuge management. For example, no law enforcement, biological, forestry, or management staff are present on the refuge half the time. The refuge lies in a remote area, and frequent flooding makes much of it inaccessible during most of the year. This isolation and seasonal inaccessibility would continue unchanged under this alternative.

The refuge currently employs a staff of four full-time workers. The refuge manager and an office assistant are located at the refuge's headquarters in Jackson, Alabama. Two maintenance workers work on the refuge itself. Because of these staffing and budgetary limitations, the refuge has only a limited amount of data on its wildlife and habitat distributions and trends, which inhibit the quantification of management objectives.

ALTERNATIVE B: ENHANCED WILDLIFE/FISHERIES AND HABITAT MANAGEMENT

Alternative B emphasizes an active and intensive management of the refuge's existing fish, wildlife, and plant habitats. Under this alternative, the refuge would update and fully implement its Forest Management Plan. Some tree harvest removal would be necessary to achieve the desired understory and midstory conditions, with an emphasis on regeneration of bottomland hardwood oaks and other mast-bearing trees. Whenever feasible, the Service would work with the U.S. Army Corps of Engineers to help adjust the hydroperiods so that summer flooding occurs at fewer intervals and for shorter periods. This would reduce the killing of oak trees and help foster oak regeneration.

Under this alternative, the refuge would use aerial and GPS/GIS techniques to document invasive aquatic plant colonization and sedimentation trends in the backwaters, sloughs, and wetlands over time. Invasive aquatic plants would be kept under control via cooperative agreements with the Corps of Engineers and the state. The refuge would initiate discussions with the Corps to reduce the impacts of flooding and high water from the operation of the Coffeeville Dam and Reservoir; and with the state to use approved methods of controlling invasive aquatic plants. These actions would be more effective in controlling and reducing the severity of aquatic plant infestations and sedimentation problems in refuge waters.

Cogongrass would be sprayed annually with an objective toward eradicating it. The refuge would investigate the replacement of cogongrass on one riverbank it now infests—and provides ground cover to avoid erosion—with native plant species. Programs like the state's Landowner Incentive Program may offer funding or technical support that could be used in private lands habitat and wildlife management, including control of problem species such as feral hogs. The Partners for Fish and Wildlife program is another possibility that would be explored.

This alternative would provide habitat for migratory waterfowl and neotropical migratory birds through the use of force-account farming (millet and grain sorghum) and intensified moist soil management. The moist soil units would be leveled and regraded to facilitate water management, and their size would be increased to 25–35 acres by converting existing crop fields. Over the 15-year life of the comprehensive conservation plan, all crop fields would be phased out and transitioned to moist soil units.

Under this alternative, the existing stock of 400 wood duck nest boxes would be maintained, but they would be more intensively monitored for the collection of nesting data. All nest boxes would be cleaned at least twice annually.

The two active bald eagle nests on the refuge would remain protected under Alternative B. They would continue to be protected by sanctuaries (closed areas) that restrict public access. It is assumed that wood storks would continue to be observed occasionally during the summer; if so, under this alternative the Service would monitor the movements of these wood storks via a radio telemetry study.

Under this alternative, contaminant specialists from the Service's Daphne, Alabama, Ecological Services Field Office would conduct new contaminant surveys on the refuge to update information on the status of key toxic contaminants such as mercury and other heavy metals, pesticides, and salt water.

Oil and gas production on the refuge would continue under Alternative B. Communication and cooperation with the oil companies would be maintained to reduce the impacts of above-ground disturbances, as well as to avoid, minimize, and mitigate spills and contamination.

Fishing under state regulations would continue to be the refuge's primary recreational use under this alternative. Both bank and boat fishing would remain available. The state would conduct periodic creel and angler surveys, as it does at present. Improved aquatic habitat management would aim to increase fish populations and angler access. This alternative would also explore stump removal to improve both fishery habitat and boat access.

Hunting and wildlife observation, the refuge's secondary public uses, would continue under this alternative. The wildlife observation platform next to the moist soil units and the 0.5-mile loop interpretive trail near the platform would be maintained. Other forest roads would permit foot travel, but overall access would remain difficult with many areas accessible only by boat. However, Alternative B would look at the possibility of constructing a bridge across the mouth of Okatuppa Creek to facilitate management access. If this bridge is built, it would also be accessible to public foot travel.

Refuge hunts would continue to include those that are held currently: an archery hunt for deer and a small game season for squirrels, rabbits, and raccoons. No waterfowl hunting would be permitted. Feral hogs would continue to be taken as incidental species during all refuge hunts. The same public access and use under this alternative would continue, with access to many areas remaining only by boat from the reservoir.

Under this alternative, the refuge staff would continue to restore bottomland hardwoods through the planting of oak trees on eight Farmers Home Administration easement tracts.

The physical isolation of the refuge from its Jackson, Alabama, headquarters office would remain unchanged under this alternative. Hands-on refuge management would therefore continue to be inhibited. Frequent flooding would continue to render much of refuge inaccessible for most of the year.

Alternative B would add one assistant refuge manager with collateral law enforcement duties to the staff, along with an additional wildlife biologist. The refuge would investigate the possibility of sharing a forester with other nearby refuges. The recommended staffing under this alternative would be six plus the shared staff member, as follows: a refuge manager, an assistant refuge manager, and an office assistant at the refuge's headquarters office; and a biologist, two maintenance workers, and the shared forester on the refuge itself.

ALTERNATIVE C: ENHANCED WILDLIFE-DEPENDENT RECREATION

Alternative C would emphasize public recreational uses and environmental education while maintaining a low level of fish and wildlife habitat management. Under this alternative, the refuge's existing Forest Management Plan would not be fully implemented. Some stand treatments would be applied, but secondary treatments (thinnings) would not. Regeneration would occur on the forest floor, but stand recruitment would continue to lag. Most saplings would not mature because of heavy foraging pressure by white-tailed deer and feral swine, frequent flooding, and shady conditions. A dense canopy would continue to inhibit regeneration of all but the most shade-tolerant trees. At first, mast production would remain high, but it will probably decrease over the long term (beyond the 15-year life of this plan) as the oaks become over-mature and are not replaced by younger, more vigorous and productive oaks.

The refuge's backwaters, sloughs, and wetlands would continue to gradually fill with sediments, a natural process that is accelerated by periods of flooding and prolonged high water from the operation of the Coffeeville Lock and Dam. This long-term sedimentation problem would continue under this alternative.

Major infestations of invasive aquatic plants such as hydrilla, alligator weed, and water hyacinth would continue to occur in virtually all of the refuge's water bodies under this alternative. These invasive weeds—most of them nonnatives—would continue to displace native aquatic and wetland plants, trap additional sediments, degrade fish habitat, and reduce dissolved oxygen. The infestations would continue to choke the refuge's backwaters, sloughs, and creeks, rendering them inaccessible to boats and anglers. At present, 75 acres of backwater slough emergents per year are treated with herbicides, and this would continue under this alternative. To a lesser extent, biological controls would also continue to be used.

Under this alternative, cogongrass would continue to be sprayed annually, and feral hogs would continue to be taken as an incidental species during the refuge's deer and small game hunts. The refuge staff would continue to trap feral hogs on a limited basis. A recent reduction in the refuge's population of feral hogs appears to be due to off-refuge trapping by one or more neighboring landowners, and this would continue under this alternative.

The refuge's bottomland forests would continue to provide important habitat for waterfowl, neotropical migrants, and resident wildlife under this alternative. In addition, the refuge would continue to actively manage habitat for migratory birds through force-account farming (35 acres) and moist-soil management (15 acres). These acreages would not change. The refuge would continue to foster the production of wood ducks by providing 400 nest boxes and cleaning them once annually. The staff would continue to monitor the nest boxes and collect nesting data.

Under this alternative, the refuge's two active bald eagle nests would continue to be protected by sanctuaries (closed areas) that restrict public access by boaters, anglers, hunters, and other visitors. It is assumed that wood storks would continue to be observed occasionally during the summer.

With regard to resource protection under this alternative, it is assumed that the Corps would continue to have limited funds for dredging areas of the refuge that have been filling in with sediments. The refuge's contaminants surveys would remain out of date, with no complete surveys conducted. Oil and gas production on the refuge would continue. The refuge staff would continue to communicate and cooperate with the oil and gas companies to reduce above-ground impacts and disturbance, and to avoid, minimize, and mitigate spills and contamination.

Under this alternative, the refuge staff would continue to work with the private landowners of eight Farmers Home Administration easement tracts to restore bottomland hardwood forests through the planting of oak trees.

Under Alternative C, fishing would remain the principal wildlife-dependent recreational activity on the refuge, and would continue to be regulated by the state. Both bank and boat fishing would continue to be available. The state would continue to conduct periodic creel and angler surveys. Within five years of plan approval, the refuge would build new fishing facilities, such as a universally accessible fishing pier. The refuge would also provide additional woody structure within the reservoir to improve fish habitat, and improve boating access through the removal of stumps and increased aquatic vegetation control.

Hunting and wildlife observation would continue to be the refuge's secondary public uses under this alternative. This alternative would also an offer an improved wildlife observation platform next to the moist soil units. A pedestrian bridge over the mouth of Okatuppa Creek would be built to facilitate and improve access to Middle Swamp. Refuge hunts would continue to include an archery hunt for deer and a small game season for squirrels, rabbits, and raccoons. A youth waterfowl hunt would be added, contingent upon having the needed staffing resources to manage the hunt. Feral hogs would

continue to be taken as an incidental species during all refuge hunts. The same public access and use under this alternative would continue, with access to many areas remaining only by boat from the reservoir. The refuge staff would also pursue more environmental education opportunities both on and off the refuge under this alternative.

The physical isolation of the refuge from its headquarters office in Jackson, Alabama (a 45-minute drive by car) would continue unchanged under this alternative. However, Alternative C would add one assistant refuge manager with law enforcement for collateral duty, as well as one park ranger. This would increase the number of refuge staff to six, as follows: a refuge manager, an assistant refuge manager, and an office assistant at the refuge headquarters; and a park ranger and two maintenance workers on the refuge.

ALTERNATIVE D: ENHANCED WILDLIFE/FISHERIES, HABITAT, AND PUBLIC USE (PREFERRED ALTERNATIVE)

Alternative D, the Service's preferred alternative, would promote more active management of the refuge's fish, wildlife, and plant habitats, as well as improved recreational and educational experiences for visitors. Under this alternative, the refuge would update and fully implement its Forest Management Plan. Some tree harvest removal would be necessary to achieve understory and midstory conditions with an emphasis on regeneration of bottomland hardwood oaks and other mast-bearing trees. Whenever feasible, the Service would work with the Corps to adjust the hydroperiods so that summer flooding occurs at fewer intervals and for shorter periods. This would avoid oak seedling mortality that now thwarts oak regeneration.

With regard to the backwaters, sloughs, and wetlands that are now filling in with sediments, this alternative would use aerial and GPS/GIS techniques to document current aquatic plant colonization and sedimentation trends over time. Invasive aquatic plants would be kept under control via cooperative agreements with the Corps and the state. The refuge would initiate discussions with the Corps to reduce the impacts of too-frequent inundation by the Coffeeville Dam and Reservoir, and with the state to use approved methods of controlling invasive aquatic plants, which trap sediments and worsen the sedimentation problem. These actions would result in more effective control and reduced severity of aquatic plant infestations, as well as slower sedimentation rates in refuge waters.

Cogongrass would be sprayed annually with an objective toward eradicating it. The refuge would investigate the replacement of cogongrass on one riverbank it now infests—and provides ground cover to avoid erosion—with native plant species. Programs like the state's Landowner Incentive Program may offer funding or technical support that could be used in private lands habitat and wildlife management, including control of problem species such as feral hogs. The Partners for Fish and Wildlife program is another possibility that would be explored.

Alternative D would provide habitat for migratory birds, including waterfowl and neotropical migrants, by using force-account farming (millet and grain sorghum) and intensified moist soil management. The staff would level and regrade the moist soil units to facilitate water management, and increase the size of the moist soil areas to 25–35 acres by converting existing crop fields. Over the 15-year life of the plan, all crop fields would be phased out and transitioned to moist soil units.

Under this alternative, the refuge staff would maintain the existing stock of 400 wood duck nest boxes, but more intensively monitor and collect nesting data from them. Each nest box would be cleaned at least twice annually.

The two active bald eagle nests on the refuge would remain protected under Alternative D. They would continue to be protected by sanctuaries (closed areas) that restrict public access by boaters, anglers, hunters, and other visitors. It is assumed that wood storks would continue to be observed occasionally during the summer; if so, under this alternative the Service would investigate the movements of these wood storks via a radio telemetry study.

Under this alternative, the refuge would obtain the assistance of contaminant specialists from the Service's Daphne, Alabama, Ecological Services Field Office to conduct new contaminant surveys on the refuge. These new surveys would update information on the status of key toxic contaminants, such as mercury and other heavy metals, pesticides, and salt water. Oil and gas production on the refuge would continue under this alternative, and the refuge would continue to communicate and cooperate with the oil companies to reduce above-ground impacts and disturbance, as well as to avoid, minimize, and mitigate spills and contamination.

Under Alternative D, fishing would remain the principal wildlife-dependent recreational activity on the refuge, and would continue to be regulated by the state. Both bank and boat fishing would remain available. The state would continue to conduct periodic creel and angler surveys. Within five years of plan approval, the refuge would build new fishing facilities such as a universally accessible fishing pier. It would also provide additional woody structure within the reservoir to improve fish habitat, and open boating and angler access via stump removal and increased aquatic vegetation control.

Hunting and wildlife observation would continue to be secondary public uses on the refuge under this alternative. This alternative would also an offer an improved wildlife observation platform next to the moist soil units. It would seek to build a pedestrian bridge over the mouth of Okatuppa Creek to facilitate and improve both management and visitor access to Middle Swamp. Refuge hunts would continue to include an archery hunt for deer and a small game season for squirrels, rabbits, and raccoons. A youth waterfowl hunt would be added, contingent on having the staffing resources to manage the hunt. Feral hogs would continue to be taken as an incidental species during all refuge hunts. The same public access and use under this alternative would continue, with access to many areas remaining only by boat from the reservoir. The refuge would pursue more environmental education opportunities both on and off the refuge.

Under Alternative D, the refuge's physical isolation from its headquarters office in Jackson, Alabama (a 45-minute driving distance by car) would continue to hamper hands-on refuge management. However, this alternative would add one assistant refuge manager with law enforcement for collateral duty and one wildlife biologist with collateral duty in visitor services. It would also investigate the sharing of a forester with other refuges. The recommended staffing under this alternative would be six plus the shared staff member, as follows; a refuge manager, an assistant refuge manager, and an office assistant at the refuge's headquarters office; and a biologist, two maintenance workers, and the shared forester on the refuge.

COMPARISON OF ALTERNATIVES

Table 15 on the following pages provides a side-by-side comparison of the four alternatives. The intent is to make the differences between alternatives readily apparent. Each alternative, if implemented, will accomplish the refuge's vision and purposes to some degree, while addressing the issues and concerns in a different way. In some cases there may be no difference or only a slight difference between the alternatives. However, it should be clear that each alternative offers a different management approach to addressing the issues and concerns.

Table 15. Comparison of management alternatives

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Migratory Ducks	Over the life of the plan, provide wintering habitat capable of harboring an overwintering population of 3,000–4,000 ducks during key wintering and reproductive seasons, partially contributing to the North American Waterfowl Management Plan's objectives, while recognizing that limited ability to manipulate habitats constrains results.	Within 5 years of plan approval, provide a healthy bottomland hardwood system and associated riverine and backwater aquatic sites capable of harboring an overwintering population of 8,000–10,000 ducks during key wintering and reproductive seasons, contributing to the North American Waterfowl Management Plan.	Same as Alternative A.	Same as Alternative B.
Migratory Ducks (continued)	Over the life of the plan, provide (in aggregate) 1,000–2,000 acres of sites where human disturbance to waterfowl is minimal during the mid-November–February period.	Within 5 years of plan approval, provide (in aggregate) 3,000–4,000 acres of sites where human disturbance to waterfowl is minimal during the mid-November–February period.	Within 5 years of plan approval, limit mid-November–February waterfowl sanctuary area to moist soil units, farming areas, and Turkey Creek area because of greater hunting opportunities.	Within 5 years of plan approval, provide (in aggregate) 3,000–4,000 acres of sites where human disturbance to waterfowl is minimal during the mid-November– February period, except during times of youth waterfowl hunt.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Wood Ducks	Over the life of the plan, maintain and monitor existing 400 wood duck nest boxes, cleaning once annually.	Over the life of the plan, maintain and monitor existing 400 wood duck nest boxes, cleaning at least twice annually.	Same as Alternative A.	Same as Alternative B.
Water Birds	Over the life of the plan, maintain existing impoundment management to provide critical foraging habitat for late summer/fall migratory waterbirds, with an emphasis on priority species. Use standard protocols to track abundance of wading birds.	Within 3 years of plan approval, determine feasibility of using an existing small impoundment (moist soil unit) and/or establish a new impoundment to provide small fin-fish for waterbirds. Use standard protocols to track abundance of wading birds.	Same as Alternative A.	Same as Alternative B.
Neotropical Migratory Birds	No active management undertaken.	Within 5 years of plan approval, increase knowledge of species status by conducting annual surveys to collect baseline data and encourage population increases due to forest habitat management.	Same as Alternative A.	Same as Alternative B.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Threatened and Endangered Species	Over the life of the plan, protect and monitor bald eagle nests and document presence of wood storks.	Over the life of the plan, protect and monitor bald eagle nests. Within 3 years of plan approval, conduct surveys of wood storks to determine movements of birds occupying the refuge, and increase foraging opportunities for wood storks.	Same as Alternative A.	Over the life of the plan, protect and monitor bald eagle nests. Within 3 years of plan approval, conduct trapping, tagging and monitoring studies of wood storks to determine movements of birds occupying the refuge.
Management of Invasive Animals	Continue trapping and incidental hunting to help control populations of feral swine to protect wildlife and the ecosystem.	Increase control of feral swine via cooperation with partners, including neighboring landowners and other agencies, to protect wildlife and the ecosystem.	Same as Alternative A.	Same as Alternative B.
Game Species	Over the life of the plan, continue planting 4–8 winter food plots totaling approximately 6 acres to benefit and manage game species, such as white-tailed deer, wild turkey, and woodcock.	Over the life of the plan, continue planting 4–8 winter food plots totaling approximately 6 acres to benefit and manage game species, such as white-tailed deer, wild turkey, and woodcock. See Objective B-1 on forest management for strategies to ensure sustainable mast production.	Same as Alternative A.	Same as Alternative B.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Shorebirds	No active management.	Within 5 years of plan approval, manage for a maximum of 30 acres of shallow, unvegetated mudflats for spring and fall migrating shorebirds and conduct shorebird monitoring surveys using the International Shorebird Survey Protocol.	Same as Alternative A.	Same as Alternative B.
Amphibians and Reptiles	No active management.	Within 5 years of plan approval, conduct surveys to identify critical breeding habitats, inventory populations, and develop protective measures, if necessary.	Same as Alternative A.	Same as Alternative B.
Fisheries	Maintain cooperation with state on aquatic habitat improvement.	Within 1 year of plan approval, develop a formal agreement with state on additional fish habitat improvement projects.	Same as Alternative B.	Same as Alternative B.
Forest Management	Implement current Forest Management Plan as limited resources permit.	Within 1 year of plan approval, update Forest Management Plan and over remaining life of plan, fully implement plan to improve understory and midstory vegetation layers to help many species of forest-dependent wildlife.	Same as Alternative A.	Same as Alternative B.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Creeks, Wetlands, and Slough Management	Maintain cooperation with state on invasive aquatic species management.	Within 1 year of plan approval, develop and begin to implement formal agreement with state to increase control of invasive aquatic species.	Same as Alternative B.	Same as Alternative B.
Moist Soil Management	Maintain existing 15 acres of moist soil units to benefit waterfowl and shorebirds.	Within 3 years of plan approval, improve moist soil management by leveling and regrading units and use of portable pumps to facilitate water management and lengthen hydroperiod; increase area to 25–35 acres from existing crop fields.	Maintain existing 15 acres of moist soil units to benefit waterfowl and shorebirds, and adjust hydroperiod to enhance opportunities to view wading birds.	Same as Alternative B.
Farming	Continue force-account farming of millet and sorghum on 35 acres.	Over life of plan, gradually phase out farming units by converting to moist soil units.	Same as Alternative A.	Same as Alternative B.
Controlling Invasive Plants	Cogongrass is sprayed annually to control spread on all sites except riverbank.	Cogongrass is sprayed annually on all sites with objective being to eradicate from refuge; map control and removal using GPS/GIS. Monitor for other invasive exotic upland plant species.	Same as Alternative A.	Same as Alternative B.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Sedimentation and Contamination	Except at boat ramp, no active management to address sedimentation and contamination issues.	Within 3 years of plan approval, begin to use aerial and GPS/GIS techniques to show current colonization by plants and to document sedimentation trends over time. Provide information to private landowners and initiate discussions with other agencies on methods of reducing sedimentation; within 7 years of plan approval, develop and begin to implement multiagency plan to control sedimentation. Use Service expertise to conduct new, comprehensive survey on contaminants in refuge. Within 3 years, update Oil and Hazardous Substances Contingency Plan.	Within 3 years of plan approval, begin to use aerial and GPS/GIS techniques to show current colonization by plants and to document sedimentation trends over time. Initiate discussions with other agencies on methods of reducing sedimentation; within 7 years of plan approval, develop multiagency plan to control sedimentation and begin to implement.	Same as Alternative B.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Private Lands Management	During life of plan, refuge staff will continue to work with private landowners of approximately eight Farmers Home Administration tracts to monitor restoration of bottomland hardwood forests (planted oak trees) on easement areas.	Refuge staff will continue to work with private landowners of approximately eight Farmers Home Administration tracts to monitor restoration of bottomland hardwood forests. Also, initiate Private Lands Program to support efforts to control feral hogs and sediments flowing onto refuge.	Same as Alternative A.	Same as Alternative B.
Cultural Resources	Limited management based on known locations of resources.	Within 10 years of plan approval, develop and begin to implement a Cultural Resources Management Plan.	Same as Alternative A.	Same as Alternative B.
Partnerships	Cooperate with Corps of Engineers (COE) and state on fisheries management and maintaining boater access, and with COE on overall refuge management.	Expand coordination with state and federal agencies to reduce and mitigate the effects of sedimentation on refuge. Expand partnerships with private sector on various issues of concern to refuge, including clear-cutting off the refuge, feral swine, and contamination.	Cooperate with COE and state on fisheries management and maintaining boater access, and with COE on overall refuge management. Also, form partnerships with Ducks Unlimited, Wild Turkey Federation, environmental education volunteers, etc.	Expand coordination with state and federal agencies to reduce and mitigate the effects of sedimentation on refuge. Expand partnerships with private sector on various issues of concern to refuge. Form partnerships with various conservation organizations and private citizen-volunteers.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Hunting	Allow limited hunting for deer, squirrel, rabbits, raccoons, and feral hogs during portions of state seasons.	Allow limited hunting for deer, squirrel, rabbits, and feral hogs.	Increase hunting opportunities for deer, squirrel, rabbits, raccoons, and feral hogs during portions of state seasons. Add a youth waterfowl hunt contingent upon having staffing resources or partners to manage hunt.	Allow limited hunting for deer, squirrel, rabbits, raccoons, and feral hogs during portions of state seasons. Add a youth waterfowl hunt contingent upon having staffing resources or partners to manage hunt.
Fishing	Maintain current angling opportunities.	Within 5 years of plan approval, provide additional woody structure within the reservoir and increase invasive aquatic vegetation control.	Within 5 years of plan approval, build new fishing facilities such as a universally accessible fishing pier, provide additional woody structure within the reservoir, and open boating access via stump removal and increased aquatic vegetation control.	Same as Alternative C.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Wildlife Observation and Photography	Maintain one observation deck and partially completed interpretive trail. Refuge is generally available to observation and photography from roads, but visitor access is difficult.	Maintain one observation deck and partially completed interpretive trail. Construction of a bridge over the mouth of Okatuppa Creek would facilitate access to Middle Swamp.	Within 1 year of plan approval, complete existing interpretive trail behind existing observation deck at moist soil units and add interpretive panels and manage units in front of observation deck to increase viewing opportunities. Within 7 years of plan approval, add observation deck at Tupelo Gum Research Natural Area, contingent upon bridge construction. Build a bridge over the mouth of Okatuppa Creek to facilitate access to Middle Swamp. Develop 2–3-mile nature trail in Middle Swamp.	Same as Alternative C.
Environmental Education and Interpretation	Continue to provide EE off-refuge to groups like Boy Scouts. Maintain existing interpretive signs on partially completed nature trail.	Same as Alternative A.	Expand EE and interpretation by enhancing interpretation on existing trail; design and install interpretive displays on new trail(s); update kiosk with standard interpretive panels. Expand use of volunteers in EE.	Same as Alternative C.

Issues	Alternative A (Current Management)	Alternative B (Enhanced Wildlife/Fisheries Habitat Management)	Alternative C (Enhanced Wildlife-Dependent Recreation)	Alternative D (Enhanced Wildlife/Fisheries, Habitat and Public Use – Preferred Alternative)
Staffing and Funding	Maintain current staff of four, including refuge manager, office assistant, and two equipment operators.	Within 5 years of plan approval, augment refuge staff by a minimum of one full-time position that would be a wildlife biologist and/or forester.	Within 5 years of plan approval, augment refuge staff by a minimum of one full-time position, which would perform visitor services and/or law enforcement as collateral duty.	Within 5 years of plan approval, augment refuge staff by a minimum of two full-time positions that would include an assistant refuge manager, wildlife biologist, and/or forester. At least one of the new staff persons would have law enforcement and/or visitor services as collateral duty.

IV. Environmental Consequences

OVERVIEW

This chapter analyzes and discusses the potential environmental effects or consequences that can be reasonably expected by the implementation of each of the four management alternatives described in Chapter II of this environmental assessment. These topics were chosen based on the important issues and concerns identified by the public and the planning team during the scoping meetings.

EFFECTS COMMON TO ALL ALTERNATIVES

A few potential effects will be the same under each alternative and are summarized under seven broad categories: environmental justice, climate change, other management, cultural resources, land acquisition, refuge revenue-sharing, and other effects.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," was signed by President Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations, with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide access for minority and low-income communities to public information and participation in matters relating to human health or the environment.

Choctaw County, where the refuge is located, does have high percentages of minorities and persons living below the poverty line. However, none of the management alternatives described in this environmental assessment will disproportionately cause any adverse environmental, economic, social, or health impacts on these minority and low-income populations. The implementation of any alternative that includes public use and environmental education is anticipated to provide a benefit to citizens of all races, ethnic groups, and income levels residing in the surrounding communities.

CLIMATE CHANGE

The U.S. Department of the Interior issued an order in January 2001 requiring its federal land management agencies to consider the potential impacts of climate change as part of their long-range planning efforts.

The increase of carbon within the earth's atmosphere has been linked to the gradual rise in surface temperature commonly referred to as global warming. In relation to comprehensive conservation planning for national wildlife refuges, carbon sequestration constitutes the primary climate-related impact to be considered in planning. The U.S. Department of Energy's *Carbon Sequestration Research and Development* (U.S. Department of Energy 1999) defines carbon sequestration as "...the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere."

The land is a tremendous force in carbon sequestration. Terrestrial biomes of all sorts—grasslands, forests, wetlands, tundra, perpetual ice, and deserts—are effective in both preventing carbon emission and acting as a biological "scrubber" of atmospheric carbon monoxide. The Department of Energy's report concluded that ecosystem protection is important to carbon sequestration and may reduce or prevent the loss of carbon currently stored in the terrestrial biosphere.

Preserving natural habitat for wildlife is the heart of any long-range plan for national wildlife refuges. The actions proposed in the comprehensive conservation plan would preserve or restore land and water, and would thus enhance carbon sequestration. This in turn would contribute positively to efforts to mitigate the impacts of human-induced global climate changes.

OTHER MANAGEMENT

All management activities that could affect natural resources, including subsurface mineral reservations, utility lines and easements, soil, water and air, and historical and archaeological resources would be managed to comply with all laws and regulations. In particular, any existing and future oil and gas exploration, extraction and transport operations on the refuge would be managed identically under each of the alternatives. Thus, the impacts would be the same.

CULTURAL RESOURCES

The U.S. Fish and Wildlife Service is responsible for managing archeological and historic sites found on national wildlife refuges. All four management alternatives afford land protection and low levels of development, thereby producing little or no negative effect on the cultural and historic environment. While the Choctaw Refuge has not yet identified any cultural resources that are eligible for listing in the National Register of Historic Places, it remains a distinct possibility. Only a portion of the refuge has actually been surveyed, and the area in general is known to contain prehistoric and historic cultural resources such as earthen mounds and prehistoric temporary encampments.

Prior to all habitat and facility maintenance activities, appropriate efforts will be made to identify known and possible cultural resources within the area of potential impact. The refuge would consult with the Service's Southeast Regional Archaeologist and the Alabama State Historic Preservation Officer in compliance with Section 106 of the National Historic Preservation Act. If cultural resources are discovered during any survey prior to a ground-disturbing action, avoidance of these resources would be the preferred treatment and mitigation of any impacts would be undertaken if the impacts cannot be avoided. The Service's policy is to preserve these resources in the public trust, avoiding impacts whenever possible.

LAND ACQUISITION

As stated earlier in this document, the Service does not own Choctaw National Wildlife Refuge. Rather, the refuge lands are owned by the U.S. Army Corps of Engineers and managed in perpetuity as a national wildlife refuge under an agreement between the Corps and the Service. Each of the alternatives continues the present policy of considering the Choctaw Refuge to be complete. The refuge's acquisition boundary equals the current refuge management boundary and all lands within the boundary are owned by the Corps. There are no inholdings. None of the alternatives contemplates acquiring the existing refuge itself from the Corps, or expanding the current acquisition boundary, or acquiring any adjacent private properties outside the acquisition boundary.

REFUGE REVENUE-SHARING

The annual refuge revenue-sharing payments to Choctaw County would continue at the same rate under each alternative.

OTHER EFFECTS

Each of the alternatives would have similar effects or minimal to negligible effects on soils, water quality and quantity, noise, transportation, human health and safety, children, hazardous materials, waste management, aesthetics and visual resources, and utilities and public services.

UNAVOIDABLE IMPACTS

Each of the alternatives would have unavoidable impacts on wildlife habitats, wildlife populations, and public uses. These impacts vary somewhat by alternative, and are discussed above in the text under each alternative and in Table 16.

DESCRIPTION OF EFFECTS

This section describes the environmental consequences of adopting each refuge management alternative. Table 16 compares the predicted outcomes for the specific issues across all four alternatives, and is organized by broad issue categories.

ALTERNATIVE A: CURRENT MANAGEMENT DIRECTION (NO ACTION)

Under this alternative, the refuge's most important terrestrial vegetation community—its bottomland forests—would continue to be managed passively in a custodial state. Forest succession would be permitted to continue, with few or no management interventions or treatments such as thinnings, planting, selective logging, or developing small forest clearings. Over the 15-year life of the comprehensive conservation plan, the forest would continue to mature. Mast production, important both for resident species and migratory birds, would remain relatively high, although it may peak and begin to decline as the dominant canopy trees become over-mature.

The shady conditions on the forest floor would also continue under this alternative, resulting in little or limited regeneration and recruitment of oaks, which tend to be shade-intolerant. Over time, then, the mast-generating oaks would likely not perpetuate themselves and the forest of the future would produce less food. In addition, the prevailing shady conditions, which have also stunted the growth of understory, midstory, shrub, and herb layers, would continue. Dense, even-aged stands with closed canopies that allow little light penetration to the forest floor do not tend to support an abundant and diverse fauna on that forest floor. Thus, over the 15-year life of the plan, habitat quality for migratory birds (including both waterfowl and neotropical migrant forest-dependent birds) and other species would not improve, and would be expected to decline.

If the current management direction is maintained over the coming 15 years, the refuge's backwaters, sloughs, and wetlands would continue the long-term process of gradually filling in with sediments. This is a natural process of ecological succession (i.e., all water bodies fill in with sediments) that has been rapidly accelerated by human activity, namely the standing water of Coffeeville Reservoir on the Tombigbee River, in which additional sediments drop out and accumulate. The existing open water areas and emergent marshes would gradually shrink, becoming both more shallow and less extensive. Invasive aquatic plants such as hydrilla, alligator weed, and water hyacinth would continue to accelerate the process.

The refuge's current aquatic weed management efforts, which consist primarily of cooperating with the state to chemically and mechanically treat about 75 acres every year, would slow, but would not stop or reverse the trend. Major infestations of nonnative aquatic plants on virtually all water bodies would continue displacing the refuge's native aquatic and wetland plants such as giant bulrush, exacerbating the effects of siltation. This in turn would further degrade and displace the emergent marshes and open water areas, with adverse effects on water-based recreation (fishing) and waterfowl habitat.

Cogongrass, an invasive exotic (nonnative) terrestrial plant, and feral swine, an exotic animal, would continue to be the focus of current management control efforts under this alternative. Cogongrass would continue to be sprayed annually, slowing but probably not halting its spread.

Feral hogs would continue to be taken as an incidental species during the refuge's deer and small game hunts. Limited trapping of feral hogs by the refuge staff would also continue under this alternative. Recently, the refuge's population of feral hogs appears to have dropped somewhat, probably due to off-refuge trapping by one or more neighboring landowners. This off-refuge trapping, as well as incidental hunting and the refuge staff's limited trapping efforts, may or may not help the refuge control wild hogs and the damage they cause to forest habitats.

The refuge would continue to actively manage habitat for migratory birds by means of force-account farming (35 acres) and moist soil management (15 acres). Under the No Action Alternative, these acreages would not change. The existing and proposed moist soil units and croplands provide benefits both for migratory ducks and resident wildlife, and these benefits would continue over the next 15 years.

The refuge would continue to assist reproduction of the wood duck by providing 400 nest boxes. These boxes would continue to be cleaned and monitored once a year. Wood ducks numbers would continue to benefit from these actions.

Barring unforeseen, outside factors beyond the refuge's control, the refuge's two federally listed species—the bald eagle and the wood stork—would in all probability continue to use the refuge in approximately the same numbers as at present. Bald eagles would still nest and fledge young, protected from disturbance at their nests by designating temporary sanctuaries.

With regard to resource protection, sedimentation would continue to be a problem under this alternative. The aquatic habitats throughout much of the refuge would continue to decline in quality and quantity as they fill in with sediments. Environmental contamination from occasional oil spills is a possibility; barge spills or contamination from sources like mercury deposition has not been well documented, but would probably not be severe and acute. However, more subtle, long-term chronic effects could be occurring, such as mercury bioaccumulation and biomagnification in fish and the birds that eat them.

Fishing would continue to be the refuge's principal public use under this alternative. The concerns expressed by the public in recent years about declining quality of the fishing experience are likely to continue and perhaps intensify, primarily because the aquatic habitats would continue to be degraded by sedimentation and invasive aquatic plants. Fish populations in the sloughs would likely decline, and access to potential fishing areas would be further limited. Under this alternative, the refuge's existing aquatic vegetation control program would only be able to slow, not stop, these unfavorable trends.

Hunting and wildlife observation would continue to be secondary public uses on the refuge. Neither the opportunities for nor the quality of these experiences are expected to change. Wildlife photography, environmental education, and interpretation would continue to take place at low rates. The chronic shortage of staff would continue to preclude the development of any real programs in these areas.

The refuge would continue to be a modest asset socially and economically to the surrounding community and to Choctaw County. However, it would continue to be underused and under-appreciated by many residents of the area and the state.

ALTERNATIVE B: ENHANCED WILDLIFE/FISHERIES AND HABITAT MANAGEMENT

Under this alternative, the refuge would update and fully implement its Forest Management Plan. Some tree harvest would be necessary to achieve the desired understory and midstory conditions, with an emphasis on regeneration of bottomland hardwood oaks and other mast-bearing trees. Whenever feasible, the Service would work with the Corps to help adjust the hydroperiods from the operation of the Coffeeville Dam and Reservoir, so that summer flooding occurs at fewer intervals and for shorter periods, thus reducing the killing of oak trees and fostering oak regeneration.

These actions, if undertaken over a wide area throughout the 15-year life of the plan, would likely result in a more diverse forest characterized by more openings, uneven-aged stands, and greater understory and midstory vegetation. In the short term, this more diverse forest structure would probably increase the attractiveness of the Choctaw Refuge to a variety of birds and mammals. Over the longer term, efforts to encourage oak regeneration would promote more sustainable mast production in the forest. As long as the clearings do not represent too large an area, they would not compromise the integrity of the habitat for forest interior-dependent birds that avoid edges or ecotones. In general, migratory birds, including both migratory ducks and neotropical migrants, would benefit from this approach to forest management.

With regard to the backwaters, sloughs, and wetlands filling in with sediments, this alternative would use aerial and GPS/GIS techniques to document current aquatic plant colonization and sedimentation trends over time. The invasive aquatic plants would be kept under control via cooperative agreements with the Corps and the state. The refuge would initiate discussions with the Corps to reduce the impacts of too-frequent inundation by the Coffeeville Dam and Reservoir, and with the state to use approved methods of controlling invasive aquatic plants, which trap additional sediments and worsen the sedimentation problem. These actions would be more effective in controlling and reducing the severity of aquatic plant infestations and sedimentation problems in refuge waters. Depending on the intensity of these efforts, both the unfavorable sedimentation and infestation trends could be reversed. Overall, Alternative B would benefit the aquatic environment at Choctaw National Wildlife Refuge.

Under this alternative, cogongrass would be sprayed annually with an objective toward eradicating it. The refuge would investigate the replacement of cogongrass on one riverbank it now infests—and provides ground cover to avoid erosion—with native plant species. Programs like the state's Landowner Incentive Program may offer funding or technical support that could be used in private lands habitat and wildlife management, including control of problem species such as feral hogs. This alternative would reduce the encroachment of upland invasives on the refuge.

Alternative B would continue to provide habitat for migratory birds, including waterfowl and neotropical migrants by intensifying moist soil management. Croplands would be phased out and converted to moist soil units, which would be increased to 50–75 acres. This habitat conversion would benefit ducks and shorebirds while providing more natural food sources. Wood ducks would also benefit from the intensification of cleaning and monitoring 400 nest boxes proposed by this alternative.

The two bald eagle nests on the refuge would remain active under this alternative. They would continue to be protected by sanctuaries (closed areas) that restrict public access by boaters, anglers, hunters, and other refuge visitors. Wood storks would continue to be observed occasionally during the summer, as in Alternative A. However, under Alternative B, the Service would investigate the

movements of these wood storks via a radio telemetry study, contributing to the knowledge needed to more effectively manage for this listed species.

Alternative B would involve greater efforts and cooperation to document and address the potential sources of environmental contamination on the refuge, including oil and gas operations, contamination along the Tombigbee River, and fallout of contaminants like mercury. These efforts could help identify and resolve potential problems that could compromise the integrity of the refuge.

Under Alternative B, fishing would remain the principal public use on Choctaw National Wildlife Refuge. The concerns expressed by the public in recent years about declining quality of the fishing experience may abate somewhat, primarily because the ongoing degradation of aquatic habitat could be halted or reversed if the more intensive efforts to control sedimentation and aquatic weed infestation are successful. The fish populations in the sloughs would likely stabilize, and angler access to potential fishing areas would be maintained or increased. The more intensive aquatic vegetation control program should be able to slow, and perhaps halt or even reverse, these unfavorable trends.

Hunting and wildlife observation, the refuge's secondary public uses, would continue under this alternative. Neither the opportunities for nor the quality of these experiences are expected to change. Wildlife photography, environmental education and interpretation would continue to take place at low rates. The chronic shortage of staff would continue to preclude the development of any real programs in these areas.

As in the No Action Alternative, under Alternative B the refuge would continue to be a modest asset socially and economically to the surrounding community and to Choctaw County. However, it would continue to be underused and under-appreciated by many residents of the area and the state.

ALTERNATIVE C: ENHANCED WILDLIFE-DEPENDENT RECREATION

In this alternative, the Choctaw Refuge's most important terrestrial vegetation community—its bottomland forests—would continue to be managed passively in a custodial state. Forest succession would be permitted to continue, with few or no management interventions or treatments such as thinnings, planting, selective logging, or the development of small forest clearings. Over the 15-year life of the comprehensive conservation plan, the refuge's forests would continue to mature. Mast production, important both for resident species and migratory birds, would remain relatively high, although it might eventually peak and begin to decline as the dominant canopy trees became over-mature.

Furthermore, the shady conditions on the forest floor would continue under this alternative, resulting in little or limited regeneration and recruitment of oaks, which tend to be shade-intolerant. Over time, then, the mast-generating oaks would likely not perpetuate themselves and the forest of the future would produce less food. In addition, the prevailing shady conditions, which have also stunted the growth of understory, midstory, shrub, and herb layers, would continue. Dense, even-aged stands with closed canopies that allow little light penetration to the forest floor do not tend to support an abundant and diverse fauna on that forest floor. Thus, over the plan's 15-year life, habitat quality for migratory waterfowl, neotropical migratory forest-dependent birds, and other wildlife would not improve, and would be expected to decline.

If this alternative were to be implemented over the coming 15 years, the refuge's backwaters, sloughs, and wetlands might begin to respond to proposed measures to control sediments and invasive aquatic vegetation. These are interrelated problems, because by reducing the depth of waters and wetlands, sedimentation makes them more vulnerable to invasion by undesirable weeds. Reducing sediments

would require cooperation with the Corps of Engineers and other agencies, as well as with off-refuge private landowners. Additional funding would be necessary to develop the structural measures needed to trap sediments or stop them from entering the refuge. It might also be necessary for the Corps to modify the operation of the Coffeeville Dam and/or water levels, or commit to periodic dredging of those areas that are filling in with sediments. Accelerated aquatic weed control could continue in the meantime to maintain the open waters and marsh habitats, but this too would require additional funding and/or commitments and partnerships. The refuge's aquatic weed management efforts, which consist primarily of cooperating with the state to chemically or mechanically treat about 75 acres every year, would be stepped up to stop or reverse the infestations.

Under this alternative, cogongrass would continue to be sprayed annually, controlling but not eradicating it. Feral hogs would continue to be taken as an incidental species during the refuge's deer and small game hunts, and the refuge staff would continue to trap feral hogs on a limited basis. A recent reduction in the refuge's population of feral hogs appears to be due to off-refuge trapping by one or more neighboring landowners. Under this alternative, limited trapping and incidental hunting of feral hogs would continue on the refuge. This off-refuge trapping, as well as incidental hunting and the refuge staff's limited trapping efforts, may or may not help the refuge control wild hogs and the damage they cause to forest habitats.

The refuge would continue to actively manage habitat for migratory birds by means of force-account farming (35 acres) and moist soil management (15 acres). Under Alternative C, these acreages would not change. The refuge's existing and proposed moist soil units and croplands provide benefits both for migratory ducks and resident wildlife, and these benefits would continue over the next 15 years.

The refuge would continue to foster the production of wood ducks by providing 400 nest boxes. These boxes would continue to be cleaned and monitored once a year. Wood duck numbers would benefit from these actions.

Barring unforeseen, outside factors beyond the refuge's control, two federally listed species—the bald eagle and the wood stork—would in all probability continue to use the refuge in approximately the same numbers as at present. Bald eagles would still nest and fledge young, and their nests would be protected from disturbance by the designation of temporary sanctuaries.

With regard to resource protection, sedimentation would continue to be a problem under this alternative. The aquatic habitats throughout much of the refuge would continue to decline in quality and quantity as they fill in. Environmental contamination from occasional oil spills is a possibility; barge spills or contamination from sources like mercury deposition have not been well documented but would probably not be severe and acute. However, subtler, long-term chronic effects could be occurring, such as mercury bioaccumulation and biomagnification in fish and the birds that eat them.

Fishing, the refuge's principal public use, would be enhanced under this alternative. New fishing facilities such as a universally accessible fishing pier would be provided, along with additional woody structure to improve fish habitat within the reservoir. In addition, boating access would be improved through increased aquatic vegetation control and a stump removal program. These actions would all serve to enhance fishing opportunities and the quality of the fishing experience for anglers.

The refuge's secondary public uses, hunting and wildlife observation, would both benefit under this alternative. For those visitors who do not have a boat at their disposal, a bridge would be built across the mouth of Okatuppa Creek to provide access to the Middle Swamp. Hunters, wildlife watchers, and nature photographers could take advantage of this bridge. In addition, this alternative would

improve the refuge's hunting opportunities by extending the areas open to certain hunts and adding a youth waterfowl hunt, contingent upon having the staff to adequately manage it.

Environmental education and interpretation would both be enhanced under this alternative. The existing interpretive trail behind the observation deck at the moist soil units would be completed. Interpretive panels would be added to better inform the public about the refuge's natural resources; and the units in front of the observation deck would be managed to increase viewing opportunities. Adding an observation deck at the Tupelo Gum Research Natural Area (contingent upon funds for bridge construction) would be a great benefit for interpretative opportunities and possibly environmental education, as would the proposed 2–3-mile nature trail in Middle Swamp.

Under this alternative, the visibility and role of Choctaw National Wildlife Refuge in the wider community would likely increase. The refuge's social and economic contributions to Choctaw County would be expanded modestly, and visitation by local and state residents may increase.

ALTERNATIVE D: ENHANCED WILDLIFE/FISHERIES, HABITAT AND PUBLIC USE (PREFERRED ALTERNATIVE)

The Service's preferred alternative would enable the refuge to update and fully implement its Forest Management Plan. Some tree harvest would be necessary to achieve the desired understory and midstory conditions, with an emphasis on regeneration of bottomland hardwood oaks and other mast-bearing trees. Whenever feasible, the Service would work with the Corps to help adjust the hydroperiods from the operation of the Coffeeville Dam and Reservoir, so that summer flooding occurs at fewer intervals and for shorter periods, thus reducing the killing of oak trees and fostering oak regeneration.

These actions, if undertaken over a wide area throughout the 15-year life of the comprehensive conservation plan, would likely result in a more diverse forest characterized by more openings, uneven-aged stands, and greater understory and midstory vegetation. In the short term, this more diverse forest structure would probably increase the attractiveness of the refuge to a variety of birds and mammals. Over the longer term, efforts to encourage oak regeneration would promote more sustainable mast production in the forest. As long as the clearings do not represent too large an area, they would not compromise the integrity of the habitat for forest interior-dependent birds that avoid edges or ecotones. In general, the approach to forest management under this alternative would benefit migratory birds, including both migratory ducks and neotropical migrants.

In addition, the preferred alternative would enable the refuge to use aerial and GPS/GIS techniques to document current aquatic plant colonization and sedimentation trends over time. These management techniques would improve the refuge's ability to address the aquatic plant infestation and sedimentation problems that are occurring in the backwaters, sloughs, and wetlands. The invasive aquatic plants would be kept under control via cooperative agreements with the Corps and the state. The refuge would initiate discussions with the Corps to reduce the impacts of too-frequent inundation by the Coffeeville Dam and Reservoir. The refuge would also work with the state to use approved methods of controlling invasive aquatic plants, which trap additional sediments and worsen the sedimentation problem. These actions would be more effective in controlling and reducing the severity of aquatic plant infestations and sedimentation problems in refuge waters. Depending on the intensity of these efforts, both the unfavorable sedimentation and infestation trends could be reversed. Overall, if fully implemented, the preferred alternative would benefit the aquatic environment at Choctaw National Wildlife Refuge.

Under the preferred alternative, cogongrass would be sprayed annually with an objective toward eradicating it. The refuge would investigate the replacement of cogongrass on one riverbank it now infests—and provides ground cover to avoid erosion—with native plant species. Programs like the state's Landowner Incentive Program may offer funding or technical support that could be used in private lands habitat and wildlife management, including control of problem species such as feral hogs. This alternative would reduce the encroachment of upland invasives on the refuge.

Alternative D would continue to provide habitat for migratory birds, including waterfowl and neotropical migrants by intensifying moist soil management. The croplands would be phased out and converted to moist soil units, increasing the size of the moist soil units to 50–75 acres. This habitat conversion would benefit ducks and shorebirds while providing more natural food sources. Wood ducks would also benefit from the intensification of cleaning and monitoring 400 nest boxes under this alternative.

The two bald eagle nests on the refuge would remain active under the preferred alternative. They would continue to be protected by sanctuaries (closed areas) that restrict public access by boaters, anglers, hunters, and other refuge visitors. Wood storks would continue to be observed occasionally during the summer, as in Alternative A. However, under the preferred alternative, the Service would investigate the movements of these wood storks via a radio telemetry study, contributing to the knowledge needed to more effectively manage for this listed species.

The preferred alternative would involve greater efforts and cooperation to document and address the potential sources of environmental contamination on the refuge, including oil and gas operations, contamination along the Tombigbee River, and fallout of contaminants like mercury. These efforts could help identify and resolve potential problems that could compromise the integrity of the refuge.

Fishing, the refuge's principal public use, would be enhanced under the preferred alternative. New fishing facilities such as a universally accessible fishing pier would be provided, along with additional woody structure to improve fish habitat within the reservoir. In addition, boating access would be improved through increased aquatic vegetation control and a stump removal program. These actions would all serve to enhance fishing opportunities and the quality of the fishing experience for anglers.

The refuge's secondary public uses, hunting and wildlife observation, would also benefit under the preferred alternative. For those visitors who do not have a boat at their disposal, a bridge would be built across the mouth of Okatuppa Creek to provide access to the Middle Swamp. Hunters, wildlife watchers, and nature photographers would be able to take advantage of this bridge. In addition, the preferred alternative would improve the refuge's hunting opportunities by extending the areas open to certain hunts and adding a youth waterfowl hunt, contingent upon having the staff to adequately manage it.

Environmental education and interpretation would both be enhanced under this alternative. The existing interpretive trail behind the observation deck at the moist soil units would be completed. Interpretive panels would be added to better inform visitors about the refuge's natural resources. The moist units in front of the observation deck would be managed to increase viewing opportunities. Adding an observation deck at the Tupelo Gum Research Natural Area (contingent upon funds for bridge construction) would also greatly benefit interpretative opportunities and possibly environmental education, as would the proposed 2–3-mile nature trail in Middle Swamp.

Finally, the visibility and role of Choctaw National Wildlife Refuge in the wider community would likely increase under the preferred alternative. The refuge's social and economic contributions to Choctaw County would be expanded modestly, and visitation by local and state residents may increase.

Table 16. Comparison of environmental effects by alternative

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Migratory Birds				
Waterfowl	Waterfowl populations would not change substantially, partially contributing to North American Waterfowl Management Plan (NAWMP) habitat and population objectives	Waterfowl populations would likely increase in response to increases in habitat quality; would provide contribute more to NAWMP habitat and population objectives	Same as Alternative A	Same as Alternative B
Shorebirds	Shorebird populations expected to remain stable and relatively low	Shorebird populations expected to increase modestly	Same as Alternative A	Same as Alternative B
Waterbirds (including marsh and colonial birds)	Waterbird populations expected to remain stable	Waterbird populations expected to increase	Same as Alternative A	Same as Alternative B
Forest Interior Birds and Songbirds (including neotropical migrants)	Populations will probably remain stable for some time and then begin to decline with changing structure and composition of forest	Populations likely to slowly increase with intensified forest management aimed at improving structure and composition	Same as Alternative A	Same as Alternative B
Raptors	Populations likely to remain stable	Same as Alternative A	Same as Alternative A	Same as Alternative B

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
American Woodcock	If present, would occur in low numbers and patchy distribution	Modest increase in suitable habitat may attract and retain woodcock on Refuge	Same as Alternative A	Same as Alternative B
Threatened and Endangered Species	Bald eagle nesting and feeding patterns unlikely to change; wood stork seasonal occurrence unchanged	Bald eagle and wood stork presence would continue; greater knowledge of wood stork could improve management	Same as Alternative A	Same as Alternative B
Habitats				
Moist Soil	No change in area and management of moist soil units	Acreage of moist soil units would roughly double and manage-ment would be more intensive	Same as Alternative A	Same as Alternative B
Bottomland Hardwood Forest	No change in area of bottomland hardwood forest; canopy trees will continue to mature; little shrub and ground layers and minimal recruitment of oaks continue	No change in area but more active forest management will lead to increase in openings and improved recruit-ment of oaks and greater shrub layer	Same as Alternative A	Same as Alternative B

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Interior Forest	No change in limited area of interior forest; canopy trees will continue to mature; only shade-tolerant trees can survive in understory	Limited areas of interior forest will be broken up by small clearings but these should not compromise their integrity	Same as Alternative A	Same as Alternative B
Grasslands (Fields)	Limited area would not change; management must intervene to prevent succession to forest	Limited area would not change; management must intervene to prevent succession to forest	Same as Alternative A	Same as Alternative B
Croplands for Waterfowl and Wildlife	Area and crops cultivated would not change	Croplands would be phased out over life of plan and converted to moist soil units	Same as Alternative A	Same as Alternative B
Open Water, Marsh, and Sloughs	Acreage would not change but would continue to fill in with sediments, lose depth, and be clogged by invasive aquatic species	Acreage would not change, but quality of habitat should improve with expanded efforts at controlling invasive aquatics and reducing sedimentation	Same as Alternative A	Same as Alternative B

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Other Fish, Wildlife, and Plants				
Invasive Species	Both aquatic and terrestrial invasive plants remain problematic; as do wild swine; limited and partially successful efforts to control all three	Increased spraying of aquatic and terrestrial plants should reduce extent of infestation; more control of wild swine through both trapping and incidental hunting	Increased spraying of aquatic plants should reduce extent of infestation of sloughs; upland invasive plants still spread unchecked; more control of wild swine through both trapping and incidental hunting	Same as Alternative B
Other Threatened and Endangered (T&E) Species (Federal)	No other species of listed animals or plants documented on refuge; presence/absence would be surveyed occasionally	Same as Alternative A	Same as Alternative A	Same as Alternative A
White-tailed Deer	Maintained and managed for a quality herd for hunting	Maintained and managed for a quality herd for hunting; improved deer habitat (forest openings) offset by loss of croplands	Same as Alternative A	Same as Alternative B

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Upland Game Birds (e.g., bobwhite quail and wild turkey)	Population levels unpredictable; no active management; no hunting opportunities	Population levels unpredictable; no hunting opportunities; forest openings would be beneficial while loss of cropland would not	Same as Alternative A	Same as Alternative B
Amphibians & Reptiles	Species unknown; populations likely stable	Same as Alternative A	Same as Alternative A	Same as Alternative A
Fisheries	Populations and species diversity either remain stable or decrease as siltation and invasive non-native plants continue to impact water bodies	Populations and species diversity likely to increase if efforts to control siltation and infestations by invasive exotic vegetation are mounted	Same as Alternative A	Same as Alternative B
Public Use				
Hunting	Hunting opportunities maintained at current levels	Same as Alternative A	Increased opportunities for deer, small game, and feral hogs; adding youth waterfowl hunt would be an additional benefit	Same as Alternative C
Fishing	High participation of moderate quality	High participation of moderate quality	High participation of improved quality	High participation of improved quality

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Environmental Education (EE) and Interpretation	Continue at current relatively low level due to lack of staffing	Same as Alternative A	Gradual improvements to EE and interpretation	Same as Alternative C
Wildlife Observation and Photography	Maintained at current low level	Same as Alternative A	Increased opportunities for wildlife observation and photography	Same as Alternative C
Lack of Awareness by Surrounding Community of the Purpose and Mission of the Refuge and the National Wildlife Refuge System	Current modest level of awareness maintained	Same as Alternative A	Awareness and under-standing increased with new facilities, EE outreach, exhibits, trails and other opportunities	Same as Alternative C
Resource Threats				
Contaminants (in water, sediments, fish)	Will likely stay the same – poorly quantified – and perhaps increase	Extent of problem will be more closely assessed and moni-tored, and, if needed, addressed	Same as Alternative B	Same as Alternative B
Siltation	Will likely stay the same or increase	May decrease due to increase in soil conservation measures	Same as Alternative B	Same as Alternative B

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Land Protection				
Acquisitions	No acquisitions or expansion of Refuge boundaries planned	Same as Alternative A	Same as Alternative A	Same as Alternative A
Farmers Home Administration (FmHA) Properties	Continue to manage 8 tracts for habitat, game species, and nongame species	Same as Alternative A	Same as Alternative A	Same as Alternative A
Partners, Volunteers, and Interns	Maintain and increase as approached by interested partners	Greater cooperation with partners and use of volunteers related to intensified habitat and wildlife management	Greater cooperation with partners and use of volunteers related to environmental education and interpretation	Greater cooperation with partners and use of volunteers related to intensified habitat, wildlife management, EA and interpretation
Private Lands	No active program other than FmHA easements	Increase assistance to and cooperation with neighboring private landowners on issues related to controlling erosion and sedimentation and nonnative invasive plants and animals such as feral hogs	Same as Alternative A	Same as Alternative B

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Refuge Administration				
Facilities	Maintain current facilities and level of protection; problems posed by separation of headquarters from refuge continue	Same as Alternative A	Same as Alternative A	Same as Alternative A
Staff	Maintain current program and staffing levels with little baseline data and continued habitat degradation Total Staff = 4	Increase staff by adding one assistant refuge manager and one wildlife biologist Total Staff = 6	Increase staff by adding one assistant refuge manager and one park ranger Total Staff = 6	Increase staff by adding one assistant refuge manager and one wildlife biologist with visitor services collateral duty; possibly share forester with other refuge(s) Total Staff = 6+

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Law Enforcement (LE)	Maintain current program/staffing (refuge manager with LE for collateral duty), while other management programs are neglected during hunting seasons and hunting opportunities are limited by LE constraints	Maintain current program/staffing (refuge manager with LE for collateral duty), while other management programs are neglected during hunting seasons and hunting opportunities limited by LE constraints	Add one staff person with LE as collateral duty; would facilitate greater hunting opportunities	Same as Alternative C
Other Human Dimensions				
Human Health and Safety	Acceptable, typical risks to hunters and anglers from accidents in the field and on the water	Same as Alternative A	Same as Alternative A	Same as Alternative A

Issues	Alternative A - Current Management Direction (No Action Alternative)	Alternative B - Enhanced Wildlife/Fisheries and Habitat Management	Alternative C - Enhanced Wildlife-Dependent Recreation	Alternative D – Enhanced Wildlife/Fisheries, Habitat, and Public Use (Preferred Alternative)
Socioeconomic	Continue to have very modest beneficial socioeconomic impacts on surrounding communities and county from spending, incomes, taxes, payments in lieu of taxes (PILT), and visitation/tourism, as well as assistance to local farmers for habitat restoration	Continue to have very modest beneficial socioeconomic impacts on surrounding communities and county from spending, incomes, taxes, PILT, and visitation/tourism, as well as assistance to local farmers for habitat restoration; possible creation of several new jobs in forestry sector from forest management on refuge	Continue to have modest positive socio-economic impacts on surrounding communities and county from spending, incomes, taxes, cooperative farming, and visitation/ tourism, as well as assistance to local farmers for habitat restoration; possible indirect generation of jobs and income related to enhanced wildlife-dependent recreation	Continue to have very modest beneficial socioeconomic impacts on surrounding communities and county from spending, incomes, taxes, PILT, and visitation/tourism, as well as assistance to local farmers for habitat restoration; possible creation of several new jobs in forestry sector from forest management on refuge as well as in recreation sector

V. Consultation and Coordination

INTRODUCTION

This Comprehensive Conservation Plan and Environmental Assessment for Choctaw National Wildlife Refuge has been written with the participation and assistance of refuge and Service staff; the Mangi Environmental Group (a Service contractor); the Alabama Division of Wildlife and Inland Fisheries; refuge complex users; and citizens from the local community. The comprehensive conservation planning process began in March 2004 with the formation of a refuge planning team; a Notice of Intent was published in the *Federal Register* prior to the formation of the team. Earlier still, in April 2002, a comprehensive biological review of the refuge was conducted in preparation for the comprehensive planning process. This biological review incorporated the expertises of a team of biologists from the Service, including Ecological Services staff and migratory bird and fire management specialists, and the State of Alabama.

In May 2004, refuge and Service personnel met to conduct a visitor services review. The information and recommendations in the reports of these two reviews proved a valuable "point of departure" for the authors of this plan. Subsequently, the refuge hosted a public scoping meeting on June 8, 2004, and began an outreach campaign through various media to collect ideas and concerns from all stakeholders. Please refer to Chapter III of the comprehensive conservation plan (Section A) for more information on the public scoping process and the overall consultation and coordination that was involved in developing the plan.

Core Planning Team Members

Robbie Dailey, Refuge Manager, Choctaw National Wildlife Refuge
Mike Dawson, Natural Resources Planner, U.S. Fish and Wildlife Service, Jackson, Mississippi
Leon Kolankiewicz, Wildlife Biologist, Planner, and Consultant, Mangi Environmental Group

Extended Planning Team Members

The extended planning team included the three members of the core planning team listed above, in addition to the following:

Joe Jernigan, Alabama Division of Wildlife and Freshwater Fisheries
Randy Roach, U.S. Fish and Wildlife Service, Daphne (AL) Ecological Services Field Office
Mike Groutt, U.S. Fish and Wildlife Service, Daphne (AL) Ecological Services Field Office

These individuals participated in one or more planning events, especially at the goals, objectives, and alternatives workshop in which the thrust of management direction and efforts over the life of the plan was developed.

Other Contributors

In addition to the above-listed core and extended planning team members, a number of other individuals and groups contributed to the plan. These included those citizens, agencies such as the U.S. Army Corps of Engineers, and nongovernmental organizations that participated in the scoping meeting and who provided input at various stages of the planning process.

SECTION C. APPENDICES

Appendix I. Glossary

Alternative - A set of objectives and strategies needed to achieve refuge goals and the desired future condition.

Biological Diversity - The variety of life forms and their processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

Compatible Use - A wildlife-dependent recreational use, or any other use on a refuge, that will not materially interfere with or detract from the fulfillment of the mission of the Service or the purposes of the refuge.

Comprehensive Conservation Plan - A document that describes the desired future conditions of the refuge, and specifies management actions to achieve refuge goals and the mission of the National Wildlife Refuge System.

Community - A distinct assemblage of plants that develops on sites characterized by particular climates and soils, and the species and populations of wild animals that depend on the plants for food, cover and/or nesting.

Ecosystem - A dynamic and interrelated complex of plant and animal communities and their associated non-living environment.

Ecosystem Approach - A strategy or plan to protect and restore the natural function, structure, and species composition of an ecosystem, recognizing that all components are interrelated.

Ecosystem Management - Management of an ecosystem that includes all ecological, social and economic components that comprise the whole of the system.

Ecotone - Edge or transition zone between two or more adjacent but different plant communities, ecosystems, or biomes.

Endangered Species - Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the *Federal Register*.

Environmental Assessment - A systematic analysis to determine if proposed actions would result in a significant effect on the quality of the environment.

Extirpation - The localized extinction of a species that is no longer found in a locality or country, but still exists elsewhere in the world.

Goals - Descriptive statements of desired future conditions.

Issue - Any unsettled matter that requires a management decision. For example, a resource management problem, concern, a threat to natural resources, a conflict in uses, or in the presence of an undesirable resource condition.

National Wildlife Refuge System - All lands, waters, and interests therein administered by the U.S. Fish and Wildlife Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish, wildlife and plant resources.

Objectives - Actions to be accomplished to achieve a desired outcome or goal. Objectives are more specific, and generally more measurable, than goals.

Preferred Alternative - The Service's selected alternative identified in the Draft Comprehensive Conservation Plan.

Scoping - A process for determining the scope of issues to be addressed by a Comprehensive Conservation Plan and for identifying the significant issues. Involved in the scoping process are federal, tribal, state and local agencies; private organizations (businesses and non-profit); and individuals.

Species - A distinctive kind of plant or animal having distinguishable characteristics, and that can interbreed and produce young. In taxonomy, a category of biological classification that refers to one or more populations of similar organisms that can reproduce with each other but is reproductively isolated from – that is, incapable of interbreeding with – all other kinds of organisms.

Strategies - A general approach or specific actions to achieve objectives.

Wildlife-dependent Recreational Use - A use of refuge that involves hunting, fishing, wildlife observation and photography, or environmental education and interpretation, as identified in the National Wildlife Refuge System Improvement Act of 1997.

Threatened Species - Those plant or animal species likely to become endangered species throughout all of or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the *Federal Register*.

Vegetation - Plants in general, or the sum total of the plant life in an area.

Vegetation Type - A category of land based on potential or existing dominant plant species of a particular area.

Watershed - The entire land area that collects and drains water into a stream or stream system.

Wetlands - Areas such as lakes, marshes, bogs, and streams that are inundated by surface or ground water for a long enough period of time each year to support, and that do support under natural conditions, plants and animals that require saturated or seasonally saturated soils.

Wildlife Diversity - A measure of the number of wildlife species in an area and their relative abundance

Appendix II. References and Literature Cited

Alabama Bureau of Tourism and Travel. 2004a. *Economic Impact: Alabama Travel Industry 2003.* http://www.800alabama.com/info/news/report.cfm.

Alabama Bureau of Tourism and Travel. 2004b. *Tours and Trails.* http://www.touralabama.org/tours-trails/.

Alabama Department of Conservation and Natural Resources. 2004. *Outdoor Alabama.* http://www.dcnr.state.al.us.

Aquaplant. 2004. Water hyacinth (*Eichhoria crassipes*). Texas Cooperative Extension Service. http://aquaplant.tamu.edu/Floating%20Plants/Water%20Hyacinth/Water_Hyacinth.htm .

Auburn University. n.d. *Alabama's Forest Resource.* Auburn University School of Forestry and Wildlife Sciences. http://www.forestry.auburn.edu/fpdc/alforest.html.

Baumgartner, Doug. 1996. Dated note written in copy of *An Archaeological Survey of the Choctaw National Wildlife Refuge* (Coblentz 1979).

Caudill, James and Andrew Laughland. 2003. *Banking on Nature 2002.* Division of Economics, U.S. Fish and Wildlife Service, Washington, D.C. 118 pp.

Chadron State College and U.S. Geological Survey. n.d. WETMAAP – Wetland Education through Maps and Aerial Photography. Mobile Bay Background Information: Mobile Bay Delta Area, Alabama. http://www.wetmaap.org/Mobile_Bay/Supplement/mb_background.html#Background (accessed August 8, 2004).

Choctaw National Wildlife Refuge. n.d.a. *Bird List.*

Choctaw National Wildlife Refuge. n.d.b. *Wildlife Inventory Plan.*

Choctaw National Wildlife Refuge. n.d.c. *Fishing and Boating.* Brochure.

Choctaw National Wildlife Refuge. 1982a. *Environmental Assessment: Proposed Opening of Choctaw National Wildlife Refuge to Upland and Big Game Hunting.*

Choctaw National Wildlife Refuge. 1982b. *Fishery Management Plan*.

Choctaw National Wildlife Refuge. 1982c. *Hunting Plan*. March, 1982.

Choctaw National Wildlife Refuge. 1985. *Public Use Development Plan*. September 18, 1985.

Choctaw National Wildlife Refuge. 1986. *Forest Management Plan*. August, 1986.

Choctaw National Wildlife Refuge. 1992. *Choctaw National Wildlife Refuge.* Brochure.

Choctaw National Wildlife Refuge. 1994a. *Cropland Management Plan.*

Choctaw National Wildlife Refuge. 1994b. *Law Enforcement Management Plan.*

Choctaw National Wildlife Refuge. 2001. *Fire Management Plan*.

Choctaw National Wildlife Refuge. 2002a. *Choctaw National Wildlife Refuge Annual Narratives, 2000-2001.*

Choctaw National Wildlife Refuge. 2002b. *Wildlife and Habitat (Biological) Review for Choctaw National Wildlife Refuge.*

Choctaw National Wildlife Refuge. 2004. Visitor Services Review Report (draft, May 12, 2004).

City-data.com. n.d. http://www.city-data.com/city/Silas-Alabama.html.

Coblentz, Becky. 2003. "Landowners battle cogongrass spread." *Mississippi Agricultural News*. Mississippi State University. http://msucares.com/news/print/agnews/an03/030919control.html.

Coblentz, Ben I. 1979. *An Archaeological Survey of the Choctaw National Wildlife Refuge*. Report of Investigations No. 5. Office of Archaeological Research, University of Alabama. Prepared for Interagency Archeological Services – Atlanta, Heritage Conservation and Recreation Service, U.S. Department of the Interior and U.S. Fish and Wildlife Service.

Environment Canada. 2004. *North American Waterfowl Management Plan.* http://www.qc.ec.gc.ca/faune/sauvagine/html/nawmp.html (accessed August 16, 2004).

Farris, Gaye. 2001. Cogongrass, Chinese Tallow Tree Invade Coastal Prairie Habitats. *People, Land & Water.* Employee news magazine of U.S. Department of the Interior. July/August 2000. http://www.usgs.gov/invasive_species/plw/cogongrass.html.

Hunter, Chuck, J. Callazo, B. Noffsinger, B. Winn, D. Allen, B. Harrington, M. Epstein, and J. Saliva. 2002. *Southeastern Coastal Plains – Caribbean Region Report, U.S. Shorebird Conservation Plan.* Revised September 2002.

McAuley, Daniel and David A. Clugston. n.d. *American Woodcock.* http://biology.usgs.gov/s+t/SNT/noframe/ne122.htm (accessed August 16, 2004).

Mississippi State University. 2004. Alligator Weed: Description. Mississippi State University Extension Service, Mississippi Agricultural and Forestry Experiment Station. http://msucares.com/wildfish/fisheries/farmpond/veg/alligator.html.

National Climatic Data Center. 2004. *Alabama Climate Summary, July 2004.* http://lwf.ncdc.noaa.gov/oa/climate/research/cag3/AL.html.

Partners in Amphibian and Reptile Conservation. 2004. *What is PARC?* http://www.parcplace.org/documents/what_is_parc.htm#WhatPARC (accessed August 16, 2004).

Plant Conservation Alliance. 2004. Cogongrass, *Imperata cylindrica*. Alien Plant Working Group. http://www.nps.gov/plants/alien/fact/imcy1.htm.

Partners in Flight. n.d. *What is Partners in Flight*? http://www.partnersinflight.org/description.cfm (accessed August 16, 2004).

Schotz, Alfred. 2003. Choctaw National Wildlife Refuge natural community and rare plant survey. Unpublished report for the U.S. Fish and Wildlife Service. The Nature Conservancy, Alabama Natural Heritage Program.

University of Alabama. 2004. Climate maps. http://alabamamaps.ua.edu/alabama/climate/.

U.S. Census Bureau. 2005a. *Alabama QuickFacts.* Updated February 2005. http://quickfacts.census.gov/qfd/states/01000.html.

U.S. Census Bureau. 2005b. *Alabama QuickFacts: Choctaw County, Alabama.* Updated February 2005. http://quickfacts.census.gov/qfd/states/01/01023.html.

U.S. Department of Energy. 1999. *Carbon Sequestration Research and Development.* U.S. Department of Energy, Washington, D.C.

U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2003. *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: Alabama*. Revised 2003.

U.S. Fish and Wildlife Service. n.d. *The Mobile River Basin.* http://southeast.fws.gov/pubs/esmobile.pdf.

U.S. Fish and Wildlife Service. n.d. *Overview of the U.S. Shorebird Conservation Plan and Council.* http://shorebirdplan.fws.gov/USShorebird/overview.htm (accessed August 16, 2004).

U.S. Fish and Wildlife Service. 1984. *A Comprehensive Plan to Resolve Resource Problems at Choctaw National Wildlife Refuge*. September, 1984.

U.S. Fish and Wildlife Service. 1988. *Oil and Hazardous Substances Contingency Plan, Choctaw National Wildlife Refuge.*

U.S. Fish and Wildlife Service. 1995. Species accounts: American Alligator (*Alligator mississippiensis*). http://species.fws.gov/species_accounts/bio_alli.html.

U.S. Fish and Wildlife Service. 2003a. *Bon Secour National Wildlife Refuge: Draft Comprehensive Conservation Plan and Environmental Assessment.* U.S. Fish and Wildlife Service, Southeast Regional Office, Atlanta, Georgia.

U.S. Fish and Wildlife Service. 2003b. *North Mississippi Refuges Complex: Biological Review.* U.S. Fish and Wildlife Service, Grenada, Mississippi.

U.S. Geological Survey. n.d. *Biogeographical Profiles of Migratory Shorebirds in Midcontinental North America.* http://www.mesc.usgs.gov/products/Publications/555/nav_tips.html (accessed August 5, 2004).

U.S. Geological Survey. 2003. Nonindigenous Aquatic Species *Hydrilla verticillata.* http://nas.er.usgs.gov/plants/docs/hy_verti.html.

Appendix III. Legal Requirements

Rivers and Harbor Act (1899) (33 U.S.C. 403): Section 10 of this Act requires the authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, or under a navigable water of the United States.

Antiquities Act (1906): Authorizes the scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

Migratory Bird Treaty Act (1918): Designates the protection of migratory birds as a Federal responsibility. This Act enables the setting of seasons and other regulations, including the closing of areas, Federal or non-Federal, to the hunting of migratory birds.

Migratory Bird Conservation Act (1929): Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

Fish and Wildlife Coordination Act (1934), as amended: Requires that the Fish and Wildlife Service and State fish and wildlife agencies be consulted whenever water is to be impounded, diverted or modified under a Federal permit or license. The Service and State agency recommend measures to prevent the loss of biological resources, or to mitigate or compensate for the damage. The project proponent must take biological resource values into account and adopt justifiable protection measures to obtain maximum overall project benefits. A 1958 amendment added provisions to recognize the vital contribution of wildlife resources to the Nation and to require equal consideration and coordination of wildlife conservation with other water resources development programs. It also authorized the Secretary of Interior to provide public fishing areas and accept donations of lands and funds.

Migratory Bird Hunting and Conservation Stamp Act (1934): Authorized the opening of part of a refuge to waterfowl hunting.

Historic Sites, Buildings and Antiquities Act (1935), as amended*:* Declares it a national policy to preserve historic sites and objects of national significance, including those located on refuges. Provides procedures for designation, acquisition, administration, and protection of such sites.

Refuge Revenue Sharing Act (1935), as amended*:* Requires revenue sharing provisions to all fee-title ownerships that are administered solely or primarily by the Secretary through the Service.

Transfer of Certain Real Property for Wildlife Conservation Purposes Act (1948):
Provides that upon a determination by the Administrator of the General Services Administration, real property no longer needed by a Federal agency can be transferred without reimbursement to the Secretary of Interior if the land has particular value for migratory birds, or to a State agency for other wildlife conservation purposes.

Federal Records Act (1950): Directs the preservation of evidence of the government's organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

Fish and Wildlife Act (1956): Established a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges.

Consolidated Farm and Rural Development Act (1961): Authorized a major expansion of U. S. Department of Agriculture lending activities, which at the time were administered by Farmers Home Administration (FmHA), but now through the Farm Service Agency. Major loan programs include farm ownership, farm operating and emergency disaster loans.

Refuge Recreation Act (1962): Allows the use of refuges for recreation when such uses are compatible with the refuge's primary purposes and when sufficient funds are available to manage the uses.

Wilderness Act (1964), as amended*:* Directed the Secretary of Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System, with final decisions made by Congress. The Secretary of Agriculture was directed to study and recommend suitable areas in the National Forest System.

Land and Water Conservation Fund Act (1965): Uses the receipts from the sale of surplus Federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

National Wildlife Refuge System Administration Act (1966), as amended by the National Wildlife Refuge System Improvement Act (1997) 16 U.S.C. 668dd668ee. (Refuge Administration Act): Defines the National Wildlife Refuge System and authorizes the Secretary to permit any use of a refuge provided such use is compatible with the major purposes for which the refuge was established. The Refuge System Improvement Act clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation); establishes a formal process for determining compatibility; established the responsibilities of the Secretary of Interior for managing and protecting the System; and requires a Comprehensive Conservation Plan for each refuge by the year 2012. The 1997 Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

National Historic Preservation Act (1966), as amended: Establishes as policy that the Federal Government is to provide leadership in the preservation of the nation's prehistoric and historic resources.

Architectural Barriers Act (1968): Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

National Trails System Act (1968), as amended: Mandates the Secretary of Interior and thus the Service to protect the historic and recreational values of congressionally designated National Historic Trail sites.

National Environmental Policy Act (1969): Requires the disclosure of the environmental impacts of any major Federal action significantly affecting the quality of the human environment.

Uniform Relocation and Assistance and Real Property Acquisition Policies Act (1970), as amended: Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the Service. The Act requires that any purchase offer be no less than the fair market value of the property.

Endangered Species Act (1973): Requires all Federal agencies to carry out programs for the conservation of endangered and threatened species.

Rehabilitation Act (1973): Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the Federal government to ensure that anybody can participate in any program.

Archaeological and Historic Preservation Act (1974): Directs the preservation of historic and archaeological data in Federal construction projects.

Clean Water Act (1977): Requires consultation with the Corps of Engineers (404 permits) for major wetland modifications.

Surface Mining Control and Reclamation Act (1977) as amended (Public Law 95-87) (SMCRA): Regulates surface mining activities and reclamation of coal-mined lands. Further regulates the coal industry by designating certain areas as unsuitable for coal mining operations.

Executive Order 11988 (1977): Each Federal agency shall provide leadership and take action to reduce the risk of flood loss and minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

Executive Order 11990 (1977)*:* Executive Order 11990 directs Federal agencies to (1) minimize destruction, loss, or degradation of wetlands and (2) preserve and enhance the natural and beneficial values of wetlands when a practical alternative exists.

Executive Order 12372 (Intergovernmental Review of Federal Programs): Directs the Service to send copies of the Environmental Assessment to State Planning Agencies for review.

American Indian Religious Freedom Act (1978): Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

Fish and Wildlife Improvement Act (1978): Improves the administration of fish and wildlife programs and amends several earlier laws including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out a volunteer program.

Archaeological Resources Protection Act (1979), as amended: Protects materials of archaeological interest from unauthorized removal or destruction and requires Federal managers to develop plans and schedules to locate archaeological resources.

***Federal Farmland Protection Policy Act (1981), as amended**:* Minimizes the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.

Emergency Wetlands Resources Act (1986): Promotes the conservation of migratory waterfowl and offsets or prevents the serious loss of wetlands by the acquisition of wetlands and other essential habitats.

Federal Noxious Weed Act (1990): Requires the use of integrated management systems to control or contain undesirable plant species, and an interdisciplinary approach with the cooperation of other Federal and State agencies.

Native American Graves Protection and Repatriation Act (1990): Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

Americans With Disabilities Act (1992): Prohibits discrimination in public accommodations and services.

Executive Order 12898 (1994): Establishes environmental justice as a Federal government priority and directs all Federal agencies to make environmental justice part of their mission. Environmental justice calls for fair distribution of environmental hazards.

Executive Order 12996 Management and General Public Use of the National Wildlife Refuge System (1996): Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the System.

Executive Order 13007 Indian Sacred Sites (1996): Directs Federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

National Wildlife Refuge System Improvement Act (1997): Considered the "Organic Act of the National Wildlife Refuge System." Defines the mission of the System, designates priority wildlife-dependent public uses, and calls for comprehensive refuge planning.

National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act (1998): Amends the Fish and Wildlife Act of 1956 to promote volunteer programs and community partnerships for the benefit of national wildlife refuges, and for other purposes.

Appendix IV. Public Involvement

The issues and concerns raised by attendees at the public scoping meeting and open house are summarized below.

Duck hunting on the refuge. Why not have? At a minimum, consider partial opportunities like lotteries and youth hunts, if not full-fledged hunts.

Consider a spring turkey hunt.

Wild hogs have been a growing problem on the refuge and in the area generally over at least the last decade.

Could revenue from permits or fees be directed toward improving habitat and wildlife management on the refuge?

Increasing hunting opportunities would increase local support for the refuge.

Need more cover for crappie, bluegill, and bass in areas that are accessible to anglers. [A fishery biologist clarified for the attendees that invasive emergent vegetation provides more than enough cover on many refuge aquatic sites, but that these areas are inaccessible to boats because of dense mats of plants on the surface.] Consider cutting some trees at the water's edge and dropping them into the water to provide structure and hiding places below the water surface.

Fishing quality has declined.

Water lilies are clogging areas.

Due to the "lake effect," fishing quality is gradually tailing off. Invasive vegetation has made the situation worse.

Hydrilla, water hyacinth, and alligator weed all are serious problems in the refuge's water bodies.

Opening duck hunting on the refuge could attract many outsiders, making it difficult for local hunters.

Outreach programs? Kids in the county are unaware of the refuge.

Staffing shortage at the refuge.

Volunteers and partners could assist the refuge, as would a "Friends" group.

The county has a dire need for summer jobs. The refuge used to offer modest employment with the YCC and YACC, but no more.

Consider innovative ways of raising funds, such as dog field trials and paid hunts.

Appendix V. Compatibility Determinations

COMPATIBILITY DETERMINATIONS

Introduction: The Fish and Wildlife Service reviewed several uses for compatibility during the comprehensive conservation planning process for Choctaw NWR. Descriptions and anticipated impacts of each of these uses are addressed separately. However, the uses through the Other Laws, Regulations, and Policy sections, the Literature Cited section, the Public Review and Comment section, and the Approval of Compatibility Determinations section apply to each use. If one of these uses is considered outside of the Comprehensive Conservation Plan for Choctaw NWR, then those sections become part of that compatibility determination.

Refuge Name: Choctaw National Wildlife Refuge

Location: Choctaw County, Alabama

Establishing and Acquisition Authority(ies): Fish and Wildlife Coordination Act. Additional acquisition authorities: Refuge Administration Act, Refuge Recreation Act, Migratory Bird Conservation Act

Refuge Purpose(s): Establishment purpose: "... shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon, ..." 16 U.S.C. § 664 (Fish and Wildlife Coordination Act).

Additional purposes: "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission: The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use: Horseback riding limited to main entrance road

The proposed use would allow for public access by horseback along the entrance road of the refuge. This 2.6 mile road is utilized by all visiting public and for all practical purposes horses would by treated as motorized vehicles. This designation would limit horses to the improved road and not increase the burden on staff for enforcement. It is anticipated that the level of use will be a maximum 6 horses per weekend during the months of March, April, May, September, and October. If it is shown that the use exceeds these limits then the use will be re-evaluated.

Anticipated impacts are no greater than the current vehicular use allowed for participation in priority public uses.

The use will be limited to the 2.6-mile main entrance road (inv. # 10038528 and 10038510) which is a gravel road running from the refuge boundary to the mouth of Okatuppa Creek. Impacts would be limited to the road and not be increased beyond what is already occurring from vehicular traffic. Resident game and non-game animals occur or can be seen from this road as well as migratory birds. The total area impacted is less than 5 acres or less than one-tenth of one percent of the total refuge.

As with all other public uses, this activity would be limited to daylight hours only and only outside of the closed season (December, January, February)

Riders would be allowed to enter the refuge on horseback in conjunction with longer rides. No loading or offloading of animals will occur on the refuge.

In response to numerous public inquiries regarding horseback riding this use is being evaluated. It would simply provide additional public use opportunities and largely viewed as another means by which wildlife observation is being allowed.

Availability of Resources:

Resources involved in the administration and management of the use: None

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs:

No additional costs are anticipated.

Monitoring costs: None

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

The use as proposed has no anticipated additional negative impacts. The positive impacts would include additional wildlife observation by a new segment of the public.

Long-term impacts:

Since the horses are being treated the same as passenger vehicles all impacts would be limited to the road bed. As stated previously, if the use increases beyond the limits this use will be re-evaluated.

Cumulative:

Due the minimal level anticipated, cumulative impacts will be negligible.

Determination:

Horseback riding	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: The use will be limited to the main entrance road and only occur when the refuge is open to other public access and use. The maximum of 6 horses per weekend will be evaluated and monitored incidental to other management activities with current staff.

Justification: The proposed use would support wildlife observation use by an additional segment of the public. The proposed use would not significantly increase negative impacts associated with the already necessary vehicular access.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Reevaluation of Boating (human-powered)

If approved through this reevaluation, this use would allow the general public access to waters over refuge managed bottoms in support of refuge recreational activities to include fishing, hunting, wildlife observation, and photography. Due to the topography of the refuge, boating is the primary means of access to the majority of the refuge for the public. An estimated 1800-2000 boats per year utilize various portions of refuge-controlled waters including the refuge boat ramp. No new facilities are anticipated to facilitate or manage this use.

Of the water areas open to the public at least during part of the, are accessible due to aquatic vegetation and are under the authority of the FWS to control access. It is anticipated that approximately 1000 acres or less than 25% of the refuge would be impacted by this use.

The use would occur during daylight hours only. Of the 1000 acres that would be open to the use upwards of 500 acres are closed from Dec 1 to March 1 when the refuge serves as a sanctuary for wintering waterfowl.

The general public would be allowed to utilize nonmotorized watercraft to access areas of the refuge open to the public to facilitate participation in other wildlife dependant recreational activities.

As stated this use is being reevaluated to support public access and participation in other wildlife dependent recreation activities.

Availability of Resources:

Resources involved in the administration and management of the use:

No additional costs due the existence of the boat ramp, as it is maintained for management purposes.

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs:

Maintenance costs would be limited to the additional grading and gravel replacement at the boat ramp parking lot. This area would have to be maintained for refuge use anyway so any additional maintenance would be negligible.

Monitoring costs: None

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

Anticipated impacts include short term disturbance in the general area of the boat ramp and litter associated with any public use facility.

Long-term impacts:

No long term impacts are anticipated.

Cumulative:

No cumulative impacts are anticipated.

Determination:

Boating (human-powered)	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: Integrity of the waterfowl sanctuary will be maintained.

Justification: This use directly supports and benefits the "Big Six" as the vast majority of the refuge is only accessible from the water.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Reevaluation of motorized boating

General motorized boating over areas of the refuge open to such use.

All accessible areas of the refuge. consisting of approximately 1000 acres of open water.

In the time period outside of December 1 through March 1 annually.

The use of motorized boats with the exclusion of personal water craft, hovercraft, and air boats to access areas of the refuge for the purpose of hunting access fishing and wildlife observation and photography.

In support of the "Big Six" public uses as the majority of the refuge is accessible only by boat.

Availability of Resources:

Resources involved in the administration and management of the use: None

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs:

Maintenance costs would be negligible as the associated facilities (access road, boat ramp, parking area) are needed and maintained for administrative use.

Monitoring costs: None

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

Impacts would be limited to disturbance in the area of the boat ramp and the litter associated with public use facilities.

Long-term impacts:

No long-term impacts are anticipated

Cumulative:

No cumulative impacts are anticipated.

Determination:

Boating (motorized)	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: Boating will be restricted to 1/2 hour before sunrise to 1/2 hour after sunset. The integrity of the waterfowl sanctuary will be maintained. The use of air boats, hovercraft, jet skis or other personal water craft is prohibited.

Justification: Impacts to the refuge would be negligible as proposed and is direct support of the Big 6.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Reevaluation of hiking, biking, jogging, walking, etc

Walking, jogging, hiking, backpacking, and bicycling, in support and in conjunction with as well as independent of the "Big 6" recreation activities. The primary areas of these uses will along refuge trails and roads which are maintained for refuge administrative and other management activities.

As stated with the exception of hiking use will be along established roads and trails maintained for management and administrative purposes. The use would occur year-round during daylight hours with the exception of the waterfowl sanctuary area which is closed from Dec.1-March 1 on an annual basis and in the buffer areas surround bald eagle nest which are closed to all entry.

The general public would utilize existing trails and roads through out the refuge to hike, bike, and jog. Due to the restrictions placed on motorized vehicles over most of the refuge these uses have become the major means of locomotion for individuals engaged in the pursuit of the "Big 6" recreational activities.

The use is proposed to support the "Big 6" recreational activities.

Availability of Resources:

Resources involved in the administration and management of the use: None

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs: None

Monitoring costs: None

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

Impacts to the refuge roads and trails would be negligible as these low impact activities will occur on areas maintained for administrative purposes. Short term disturbance may be experienced with regard to wildlife as animals are disturbed by the human activity. Past experience has shown that some disturbance to the plants along the routes of travel will be impacted but as these roads and trails are maintained for administrative purposes these impacts are negligible.

Long-term impacts:

Long -term impacts such as compaction, rutting, displacement or change in travel patterns or use of areas by wildlife is not anticipated due to the low level of participation in these activities.

Cumulative:

As discussed in the long -term impacts due to the low level participation impacts are anticipated to be negligible.

Determination:

Hiking	Use is compatible with the following stipulations.
Bicycling	Use is compatible with the following stipulations.
Jogging	Use is compatible with the following stipulations.
Walking	

Stipulations Necessary to Ensure Compatibility: To insure that impacts are minimal bicycles will be restricted to the existing and maintained roads. Hiking (walking) and backpacking will be of such a low level as to give little or no impact. Due to the geography and climate of the refuge that jogging that may occur will be restricted to the multipurpose entrance road. All activity will be restricted in the waterfowl sanctuary and in the buffer areas around the eagle nests.

Justification: The uses are in direct support of and in conjunction with the "Big 6" i.e. hunters utilize bicycles along the roads in the Middle Swamp area of the refuge as motorized vehicles are restricted.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Commercial fishing

The proposed use would allow for the commercial fishing of non-game fish as defined by Alabama State Law in Refuge waters by means of "boxes" and "baskets" per State Law.

The use would be conducted along the creek channels and lakes within the refuge. Due to the jurisdictional boundaries fishing within the historic creek channels can occur as they are not refuge property. However these boundaries are impractical to delineate.

The use would occur year-round except in those areas closed to access such as buffer areas for bald eagle nest (closed permanently) and areas within the waterfowl sanctuary (closed Dec.1-March 1 annually).

As stated this use would be limited to baskets and boxes cumulative total of 10 per permittee and a maximum of 5 permittees per year would be issued annual permits. Harvest records will be required to be submitted to the refuge by all permittees on an annual basis. Information required will include the number of boxes fished and the dates, the number of fish by species caught and total weight

This form of fishing is both considered an economic use of the refuge as well as due to the historic sociologic nature of this activity in this area is considered a recreational activity. Harvest information obtained from these fishermen is an important source of information for management of various species of rough fish that are otherwise "untracked" by use of any other sampling methods.

Availability of Resources:

Resources involved in the administration and management of the use:

Administration of this activity at the proposed level can occur with the current available resources. If staffing levels structure changes then the use may have to be reevaluated.

Special equipment, facilities, or improvements necessary to support the use:

Equipment and facilities proved to other users will be utilized by the commercial fishermen i.e. refuge boat ramp.

Maintenance costs:

No additional maintenance costs are anticipated.

Monitoring costs:

Monitoring and essentially re-evaluation of his use will occur on an annual basis when harvest information is provided to the manager.

Offsetting revenues:

The Special Use Permits issued will require payment of a $50.00 fee.

Anticipated Impacts of the Use:

Short-term impacts:

Anticipated impacts include short term disturbance in the general area of the boat ramp and litter associated with any public use facility.

Long-term impacts:

No long-term impacts are anticipated with this use.

Cumulative:

No cumulative impacts are anticipated.

Determination:

Fishing (commercial)	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: Fishing will be limited to those areas and times open for other recreational uses and public access. A maximum of 5 permits will be issued annually. A cumulative maximum of 10 boxes/baskets will be allowed per permittee. Harvest data is required from all permittees. Law Enforcement and administrative staff must be available to manage and regulate this use.

Justification: This use as proposed does not significantly interfere nor otherwise detract from the refuges' goals and objectives. As stated previously this could be considered a recreational activity in this area. This use will assist the refuge with management of fishery resources on the refuge through the collection of harvest information that must be provided.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Forest Management

This is a reevaluation of the current Compatibility Determination for forest management. Management of the refuge under the current Forest Management Plan calls for the removal (harvest) of some trees for the purpose of regeneration of the forest. The most feasible method for management is through the use of commercial sales.

Additionally the use of "firewood permits" is being proposed as a means to facilitate cleanup of downed trees on refuge roads and trails.

No new facilities would be associated with these uses.

The proposed use would be conducted over all accessible areas of the refuge.

For the purpose of commercial sales on the refuge, all work would be conducted in the late Summer and early Fall. Firewood permits would be limited to only those areas and times in which the Public has access.

Commercial sales would be conducted by sealed bid sales. Firewood permits would be issued on a first-come basis and limited to one load/person.

To facilitate management of the refuge through the implementation of the Forest Management Plan, firewood permits would "free up" refuge personnel from cleanup of roadways.

Availability of Resources:

Administrative cost of the commercial sales would be covered by the sale.

Special equipment, facilities, or improvements necessary to support the use:

No new facilities or equipment will be required.

Maintenance costs:

Maintenance associated with refuge roads impacted by this use will be born by the successful bidder as specified in the Special Use Permit.

Monitoring costs:

Monitoring will be conducted in conjunction with other refuge programs and will result in negligible operational costs increases.

Offsetting revenues:

Revenues from the sale of timber resources will be used to offset any monitoring and administrative costs.

Anticipated Impacts of the Use:

Short-term impacts:

Impacts are described in the draft Environmental Assessment for the Choctaw NWR draft Comprehensive Conservation Plan.

Long-term impacts:

No Long term adverse impacts are anticipated from this activity. Some short term disturbance of animals while operations are underway should be minimal. Impacts to other compatible refuge uses (i.e. hunting) would be of such minimal levels and of such short duration that adverse conditions should not occur.

Cumulative:

No cumulative adverse impacts are anticipated.

Determination:

Tree harvest (firewood)	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: All T.S.I. management harvesting will be done in accordance with an approved prescription for the unit being treated. The prescription will specify volume to be cut, timing of when harvest will be made, and all operational guidelines that must be followed. Operations will be inspected periodically for compliance and remedial action taken as specified in the prescription and the Special Use Permit issued to the successful bidder. Firewood permits will be limited to one/person and limited to one load. Firewood will only be harvested from downed tree along the refuge roads and limited to only those trees identified by refuge personnel as presenting a hazard or hindrance to management. Spot inspections will conducted by refuge Law Enforcement personnel.

Justification: This proposed use directly supports management goals for the refuge through the enhancement of timber stands on the refuge. Due to impacts from the Corp of Engineers Coffeville Lock and Dam project the altered hydrology has impacted forest regeneration and without this action diversity in both species and stand structure will not occur, negatively impacting the fauna occurring on the refuge. Additionally the overall health and sustainability of the oak forest will be impacted. As stated previously the staff time spent dealing with downed trees that may be cleaned up through the issuance of firewood permits detracts from other areas of refuge management. Overall this use supports and benefits both the biological communities and other compatible priority wildlife dependent uses. This use directly contributes to the goals as described in the Forest Management Plan and the associated prescriptions for various units of the refuge forest.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Reevaluation of wildlife observation and photograghy

Wildlife observation and photography would occur throughout the refuge on any area open to public use. These uses would be permitted year-round subject seasonal closure of specific areas for the purpose of serving as a waterfowl sanctuary. Other approved uses such as hiking, boating, and biking would facilitate these uses and have been evaluated under separate Compatibility Determinations.

This use would be allowed throughout the refuge on areas open to public use and be concentrated at the scenic overlook on Hackberry Lake and at the hiking trail and observation platform.

The use would be conducted year-round subject to seasonal closure (December 1- March 1) of some areas for waterfowl sanctuary.

Primarily this use would be conducted by foot travel with some individuals utilizing the hiking trail and observation platform. Other users would take advantage of the extensive waterways available and open to both motorized and non-motorized boating.

This use would be conducted to allow for the public's enjoyment of the refuge.

Availability of Resources:

Resources involved in the administration and management of the use:

Upkeep of existing facilities i.e. foot trail and observation platform is less than $1,000.00 per year. Other facilities i.e. boat ramp, refuge roads are required for management and use by the public does not result in any appreciable additional costs.

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs: None

Monitoring costs:

Monitoring costs would be incidental to other management activities.

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

Anticipate impacts would be short term and minimal. Most impacts would result in violation of refuge regulations, i.e., littering, wildlife disturbance.

Long-term impacts:

No long -term impacts are anticipated.

Cumulative:

No cumulative impacts are anticipated

Determination:

Photography (wildlife)	Use is compatible with the following stipulations.
Wildlife observation	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: These uses would only be allowed in areas open to other public use. Adequate Law Enforcement presence and monitoring is required to ensure compliance with refuge regulations.

Justification: These uses support the goals and purposes of the refuge and are wildlife-dependant priority public uses.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Reevaluation of recreational fishing

Recreational fishing would occur throughout the refuge on areas open to public use. As a wildlife-dependant priority public use this activity would be conducted year-round subject to seasonal closures of specific areas for use as a waterfowl sanctuary. Approximately 10,000 visits per year can be expected utilizing various methods of access i.e. bank fisherman, boat fisherman, fishing pier. Existing refuge facilities such as the boat ramp and access roads are required for the administration of the refuge and other refuge uses and any additional impact from the public participating in this activity would be reliable.

The use would be conducted throughout the refuge open to public use.

The use would be conducted year-round subject to closure of specific areas for waterfowl sanctuary and buffer areas around eagle nests.

The general public would be allowed access to refuge backwaters, and lakes for the purpose of sport fishing limited to the use of rod/reel, pole and line. This access would be allowed to both foot and by motorized and non-motorized boats which have been evaluated under separate compatibility determinations.

This use would be allowed for the public's enjoyment of the refuge.

Availability of Resources:

Resources involved in the administration and management of the use:

Existing law enforcement would be utilized in enforcement of refuge regulations.

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs: None

Monitoring costs: None

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

Anticipated negative impacts would result in some violation of refuge or State regulations (incorrect equipment, overlimits, littering). Other impacts, such as disturbance of wildlife, would be of very short duration.

Long-term impacts:

Short term disturbance of plants and animals is anticipated through the presence of the users.

Cumulative:

No long term impacts are anticipated.

Determination:

Fishing (general)	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: Use would be limited to sport fishing equipment (rod and reel, line and pole). Trotlines, limb lines, nets, boxes, baskets would not be permitted. Areas of the refuge are subject to seasonal closure for the purpose of waterfowl sanctuary.

Justification: The use is one of the "Big 6" and supports the goals and purposes of the refuge.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Environmental Education and Interpretation Programs

Environmental education and interpretation programs conducted on the refuge primarily limited to group tours and talks utilizing existing facilities. It is estimated that up to 150 individuals per year would participate in these activities.

This use would be limited to areas open to other public use such as the hiking trail observation platform and other areas open to wildlife observation and photography.

The use would be conducted year round subject to the seasonal closure of areas for the purpose waterfowl sanctuary.

This use would consist of guided tours and educational programs primarily targeted at students. Existing facilities and planned future facilities (outdoor classrooms) would be utilized.

This use would be conducted in support of the purposes of National Wildlife Refuges and provide an opportunity not available anywhere else in this area.

Availability of Resources:

Resources involved in the administration and management of the use:

Some minimal level of these programs could be implemented within the existing level of staffing and funding however for full implementation as described in the CCP increased staffing and facilities as described in the CCP would be required.

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs: None

Monitoring costs: None

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

Anticipated impacts include the short term disturbance of plants and animals.

Long-term impacts:

No long term impacts are anticipated.

Cumulative:

No cumulative impacts are anticipated.

Determination:

Environmental education and interpretation	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: Use would be limited by availability of staff. Use would be limited to areas open to other public uses.

Justification: This use supports the goals and purposes of the refuge .

Mandatory 10- or 15-Year Re-Evaluation Date: _____

Description of Use: Reevaluation of existing hunting programs

Hunting of upland game (small game) and big game as described in the Refuge Hunting Plan and CCP. Note this C.D. does not address Migratory Bird hunting as described in the CCP.

This use would be conducted throughout the refuge on areas not closed to public access either in whole or seasonally.

This use would be conducted within the framework of seasons outlined by the State annually.

The general public would be allowed through the use of a permit system to access the refuge for the purpose of participating in upland and big game hunts. These hunts include both archery and gun hunts. Those species allowed to be hunted are identified in the current and any future hunt plans. The existing refuge facilities that would be used by the public in pursuit of hunting are multipurpose and utilized by all refuge visitors (access roads, boat ramp)

As one of the "Big 6" this use is conducted to satisfy the desire of the Public to participate in hunting opportunities on the refuge. Very few public hunting opportunities exist in the State.

Availability of Resources:

The primary resources involved would be the presence of law enforcement personnel. These personnel are needed to be in place for the overall protection of the refuge resources. Other resources are used for other refuge management and public use programs.

Special equipment, facilities, or improvements necessary to support the use: None

Maintenance costs:

Experience has shown that there is no significant increase in maintenance costs associated with the hunting program as currently implemented.

Monitoring costs:

Hunters are required to report harvest information i.e. sex ,age, weight and numbers on all game taken during refuge hunts. Compilation and evaluation of this information typically falls upon the staff member responsible for biological information and typically take 2 days. This information is then utilized by management to make decisions on future seasons and bag limits. Law enforcement personnel monitor and enforce compliance with refuge regulations.

Offsetting revenues: None

Anticipated Impacts of the Use:

Short-term impacts:

Short term impacts include the disturbance of plants an animals. Other impacts would be the result of non-compliance with refuge regulations.

Long-term impacts:

Long term impacts are largely favorable assuring the overall health of the animal populations occurring on the refuge.

Cumulative: None

Determination:

Hunting (big game)	Use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility: Hunting seasons will be set annually with concurrence of the State. Areas are subject to closure to hunting or other access for the purpose providing waterfowl sanctuary and buffer areas to eagle nests. Adequate staffing(law enforcement and management) will be maintained to assure minimal impacts to other refuge resources and programs. The harvest information will be reviewed annually to evaluate the hunting programs impact on the overall health and condition of wildlife populations.

Justification: This use meets the goals and objectives of the refuge and Refuge System and provides the public the opportunity to participate in one of the wildlife dependent priority public uses.

Mandatory 10- or 15-Year Re-Evaluation Date: _____

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

___ Categorical Exclusion without Environmental Action Statement

___ Categorical Exclusion and Environmental Action Statement

_X_ Environmental Assessment and Finding of No Significant Impact

___ Environmental Impact Statement and Record of Decision

Approval of Compatibility Determination

The signature of approval is for all compatibility determinations considered within the comprehensive conservation plan. If one of the described uses is considered for compatibility outside of the plan, the approval signature becomes part of that determination.

Refuge Manager: _____
(Signature/Date)

Regional Compatibility Coordinator:

_____
(Signature/Date)

Refuge Supervisor: _____
(Signature/Date)

Regional Chief, National Wildlife Refuge System, Southeast Region: _____
(Signature/Date)

Appendix VI. Priority Bird Species and Species Suites

Bird Conservation Region (BCR) 27 priority species (B=Breeding, N=Non-breeding, T=Transient, PB=Post-breeding; FE=Federally Endangered, FT=Federally Threatened, SL=listed in at least one State within BCR)

Tier I. Species of high continental and/or regional concern (regional combined score presented only for tier I species, except waterfowl)

Immediate Management

25 Ivory-billed Woodpecker (B, N) also FE (extirpated?) SL
25 Bachman's Warbler (B) also FE (extirpated?), SL
25 Kirtland's Warbler (T) also FE, SL

23 Red-cockaded Woodpecker (B, N) also FE, SL
23 Henslow's Sparrow (N)
23 Saltmarsh Sharp-tailed Sparrow (N) also SL

22 Bermuda Petrel (N, pelagic) also FE
22 Audubon's Shearwater (N, pelagic)
22 Whooping Crane (T) also FE, SL
22 Piping Plover (B, N) also FT, SL
22 Florida Scrub-Jay (B, N) also FT (extirpated?), SL

20 Snowy Plover (B, N) also SL
20 Henslow's Sparrow (B) also SL

19 American Woodcock (N)
19 Whimbrel (N) also RS
19 Long-billed Curlew (N)

18 Sandhill Crane (B, N) also FE (MS), SL (AL, FL, MS)
18 Cerulean Warbler (B) also SL
18 Painted Bunting (B)

17 Purple Gallinule (B)

16 Wood Stork (B, N) also FE, SL
16 Limpkin (B, N) also SL
16 Common Ground-Dove (B, N) also SL
16 Loggerhead Shrike (B, N) also SL
16 Bewick's Wren (B, N) also SL

16 Black-throated Green Warbler (B) also SL

15 American Coot (B only) also SL
15 Common Tern (B only) also SL

Management Attention

22 Black Rail (B, N)
22 Bicknell's Thrush (T)

21 Black-capped Petrel (N, pelagic)
21 Yellow Rail (N)
21 American Oystercatcher (B, N) also SL
21 Bachman's Sparrow (B, N) also SL

20 Wilson's Plover (B) also SL
20 Buff-breasted Sandpiper (T)
20 Black Skimmer (B, N) also SL

20 Brown-headed Nuthatch (B, N)

19 Horned Grebe (N)
19 Semipalmated Sandpiper (T)
19 Short-billed Dowitcher
19 Least Tern (B) also FE (Interior subsp.) SL

18 Red-throated Loon (N)
18 King Rail (B, N) also SL
18 Upland Sandpiper (T)
18 Marbled Godwit (N)
18 Least Sandpiper (N)
18 Stilt Sandpiper (T)
18 Wilson's Phalarope (T)
18 Gull-billed Tern (B) also SL
18 Prairie Warbler (B)
18 Swainson's Warbler (B) also SL
18 Nelson' Sharp-tailed Sparrow (N)
18 Rusty Blackbird (N)

17 American Bittern (N) also SL
17 Tricolored Heron (B, N) also SL
17 American Golden-Plover (T)
17 American Avocet (N)
17 Lesser Yellowlegs (N)
17 Red Knot (N)
17 Sanderling (N)
17 Western Sandpiper (N)

17 Dunlin (N)
17 Sandwich Tern (B)
17 Common Tern (T)
17 Black Tern (T)
17 Le Conte's Sparrow (N)

16 Northern Bobwhite (B, N)
16 Northern Gannet (N)
16 Magnificent Frigatebird (N)
16 Swallow-tailed Kite (B) also SL
16 White Ibis (B, N) also SL
16 Black-bellied Plover (N)
16 Ruddy Turnstone (N)
16 Razorbill (N, pelagic)
16 Chuck-will's-widow (B)
16 Eastern Towhee (B, N)

15 Common Loon (N)
15 American White Pelican also SL
15 Little Blue Heron (B, N) also SL
15 Black-crowned Night-Heron (B, N) also SL
15 Yellow-billed Cuckoo (B)
15 Short-eared Owl (N)
15 Chimney Swift (B)
15 Northern Flicker (B, N)
15 Eastern Kingbird (B)
15 Brown Thrasher (B, N)
15 Wood Thrush (B)
15 Field Sparrow (B, N)
15 Grasshopper Sparrow (N)

14 Pied-billed Grebe (B only) also SL
14 Least Bittern (B) also SL
14 Snowy Egret (B, N) also SL
14 Yellow-crowned Night-Heron (B, N) also SL
14 Glossy Ibis (B, N) also SL
14 Northern Harrier (N)
14 American Kestrel (B) also SL
14 Common Moorhen (B, N) also SL
14 Eastern Wood-Pewee (B, N)
14 Vesper Sparrow (N)
14 White-throated Sparrow (N)
14 Eastern Meadowlark (B, N)

Brant (N)
Canada Goose (N) (Southern James Bay and Atlantic migratory pops.)
American Black Duck (N, B locally in NC, VA)
Northern Pintail (N)

Canvasback (N)
Redhead (N)
Lesser Scaup (N)
Black Scoter (N)

Planning and Responsibility

22 Seaside Sparrow (B, N) also SL

19 Wilson's Snipe (N) also RS

17 Solitary Sandpiper (N) also RS

16 Greater Shearwater (N, pelagic)
16 Band-rumped Storm-Petrel (N, pelagic)
16 Bridled Tern (N, pelagic)
16 Prothonotary Warbler (B)
16 Kentucky Warbler (B)

15 Red-headed Woodpecker (B, N) also SL
15 Blue-winged Warbler (B)
15 Worm-eating Warbler (B)

14 Cory's Shearwater (N, pelagic)
14 Manx Shearwater (N, pelagic)
14 Red Phalarope (N, pelagic)

13 Dickcissel (B)

Mottled Duck (B, N; not including introduced populations)

Tier II. Species not otherwise of continental nor regional concern where monitoring (i.e., all planning and responsibility) attention is needed to ensure population stability

Planning and Responsibility

Tundra Swan (N)
Wood Duck (B, N)
Red-shouldered Hawk (B, N)
Clapper Rail (B, N)
Sandhill Crane (T) (eastern population segment of Greater subspecies)
Semipalmated Plover (N)
Killdeer (N)
Greater Yellowlegs (N)
Willet (B, N)
Spotted Sandpiper (N)
Pectoral Sandpiper (T)
Bonaparte's Gull (N)

Royal Tern (B, N)
Forster's Tern (B, N)
Red-bellied Woodpecker (B, N)
Acadian Flycatcher (B)
White-eyed Vireo (B)
Yellow-throated Vireo (B)
Carolina Chickadee (B, N)
Sedge Wren (N)
Marsh Wren (B, N) also SL
Carolina Wren (B, N)
Northern Parula (B)
Yellow-throated Warbler (B)
Cape May Warbler (T)
Black-throated Blue Warbler (T)
Pine Warbler (B, N)
Blackpoll Warbler (T)
Connecticut Warbler (T)
Hooded Warbler (B)
Summer Tanager (B)
Indigo Bunting (B)
Bobolink (T)
Orchard Oriole (B)

Tier III. Species where at least monitoring attention is needed to ensure population persistence (i.e., all at least planning and responsibility), but management attention may or may not be necessary based on legal requirements and political boundaries

Tier III a. **Additional Federally Listed**

Brown Pelican (B, N) FE in MS and LA, also SL (FL, MS, LA, SC, VA)
Bald Eagle (B, N) FE also SL (AL, FL, GA, KY, LA, MS, NC, SC, TN, VA)
Roseate Tern (N, pelagic, casual B) FT also SL (FL, NC, VA)

Tier III b. **Additional State Listed**

Trumpeter Swan (N) KY
Blue-winged Teal (B) KY
Northern Shoveler (B) KY
Hooded Merganser (B) KY
Double-crested Cormorant (B) KY
Anhinga (B, N) TN
Great Blue Heron (B) KY
Great Egret (B) KY, TN, VA
Reddish Egret (B) AL, FL
Cattle Egret (B) KY
Black Vulture (B, N) NC
Osprey (B) KY
Mississippi Kite (B) KY, SC, TN

Northern Harrier (B) KY, TN, VA
Peregrine Falcon (N) KY, TN, LA, AL, FL, GA, SC, NC, VA
Cooper's Hawk (B) AL, NC, SC
Spotted Sandpiper (B) KY
Barn Owl (B, N) KY, SC, TN
Burrowing Owl (B) FL
Bell's Vireo (B) KY
Bank Swallow (B) KY
Sedge Wren (B) KY
Lark Sparrow (B) KY, TN
Bobolink (B) KY

Tier III c. **Additional politically recognized species (e.g., natureserve s1, s2)**

[REFER TO EACH STATE'S NATURAL HERITAGE DATABASE; MANY SPECIES ABOVE ARE LIKELY INCLUDED IN MANY OF THE DATABASES WITHIN THE STATES THEY OCCUR IN]

Tier IV. Other species of conservation or management interest, not otherwise listed above (local or regional interest=lori species; some species may be listed in more than one sub-tier below)

Tier IV a. **Locally Rare or Peripheral Species of Interest (e.g., certain nonbreeding hummingbird species found in the Southeast U.S., Continental Concern species with RD=1)**

Short-tailed Hawk (B)
Black-necked Stilt (B)
Purple Sandpiper (N)
Sooty Tern (B)
Common Nighthawk (B)
Willow Flycatcher (B)
Gray Kingbird (B)
Warbling Vireo (B)

Tier IV b. **Game Species of Particular Local or State Management or Economic Interest (e.g., Wild Turkey, many species of waterfowl)**

Snow Goose (N)
Gadwall (N)
American Wigeon (N)
Mallard (N)
Blue-winged Teal (N)
Green-winged Teal (N)
Ring-necked Duck (N)
Greater Scaup (N)
Common Goldeneye (N)
Bufflehead (N)
Wild Turkey (B, N)
Virginia Rail (N)

Sora (N)
American Coot (N)
Mourning Dove (B, N)

Tier IV c. **Nongame Species of Particular Local or State Management or Economic Interest (e.g., Ruby-throated Hummingbird, Purple Martin, Eastern Bluebird)**

Tier IV d. **Species frequently occurring as a regional concern species in other BCRs, just not in this one, with RD>2 (good to keep track of species where they are doing well, when in many BCR's they are not doing well)**

Louisiana Waterthrush (B)

Tier IV e. **Species Important as Environmental Indicators (e.g., many species of raptors, such as Osprey, and herons, such as Great Blue Heron)**

Tier IV f. **Nuisance or Depredating Species (e.g., crows, grackles, cowbirds, most blackbirds, double-crested cormorants)**

Local or Regional Population Control/Suppression
Canada Goose (resident populations, especially where they might compete for food resources with migratory populations)

Double-crested Cormorant (non-breeding populations associated with aquaculture in AL, MS)

American White Pelican (non-breeding populations associated with aquaculture in AL, MS)

Cattle Egret (colonies in developments, health and safety, replacing other species)

Laughing Gull (where depredation threatens the stability of other colonial waterbirds)

Herring Gull (where depredation threatens the stability of other colonial waterbirds)

Great Black-backed Gull (where depredation threatens the stability of other colonial waterbirds)

Tier IV g. **Continental Stewardship Species high RD>3 or TB=1**

***Action Level:**

IM=Immediate management needed to reverse or stabilize significant, long-term population declines in species with small populations, or to protect species with the smallest populations for which trends are poorly known. Lack of action may lead to extirpations or extinction. Generally species with a TB/TN=5 or a TB/TN=4+PT=5 fall under this action level.

MA=Management or other on-the-ground conservation actions needed to reverse or stabilize significant, long-term population declines in species that are still relatively abundant. All other Regional Concern species that are not IM, fall under this action level. Some Federally or State/Provincial listed species not otherwise meeting either Continental or Regional Concern criteria may fall under this action level.

PR=Long-term Planning and Responsibility needed for species to ensure that sustainable populations are maintained for species for which a region has high responsibility for that species. All Continental Concern species that are not also Regional Concern species fall under this action level, as well as any additional Regional Stewardship and Continental Stewardship species and any additional LORI species identified.

PC = Population Control/Suppression needed for species that are otherwise secure and increasing that may come into conflict with other species of higher conservation concern or other resources of interest.

PCL = Local or Regional Population Control/Suppression that generally are species listed as in need of Management Attention or Long-term Planning and Responsibility, but locally may be subject to population control measures to alleviate documented economic, environmental, or human health and safety conflicts, but only when economics and conservation implications have been thoroughly considered.

Appendix VII. Biota

Due to the lack of basic inventories conducted to date at Choctaw National Wildlife Refuge, the only class of vertebrates for which a species list has been generated is birds. Lists have not yet been made documenting which mammals, reptiles, amphibians or fish are known to occur on the refuge.

BIRDS

Common Name	Scientific Name	W	Sp	Su	F
Loons					
Common Loon	*Gavia immer*	s			
Grebes					
Pied-billed Grebe	*Podilymbus podiceps*	c		u	
Pelicans					
American White Pelican	*Pelecanus erythrorhynchos*				o
Cormorants					
Double–crested Cormorant	*Phalacrocorax auritus*	o	s		s
Darters					
Anhinga*	*Anhinga anhinga*		c	c	o
Herons, Egrets, and Allies					
Great Blue Heron*	*Ardea herodias*	c	c	c	c
Great Egret*	*Ardea alba*	c	c	c	c
Snowy Egret*	*Egretta thula*		u	c	s
Little Blue Heron*	*Egretta caerulea*		c	c	u
Tricolored Heron	*Egretta tricolor*		s		
Cattle Egret*	*Bubulcus ibis*		c	c	
Green Heron	*Butorides virescens*		u	u	
Yellow-crowned Night-Heron*	*Nycticorax violacea*	o	c	c	
Ibis and Storks					
White Ibis*	*Eudocimus albus*	a	o	c	
Wood Stork	*Mycteria americana*			u	
Waterfowl (Ducks, Geese, and Swans)					
Snow Goose	*Chen caerulescens*	o			
Canada Goose	*Branta Canadensis*	r			r
Wood Duck*	*Aix sponsa*	a	a	a	a

Common Name	Scientific Name	W	Sp	Su	F
Green-winged Teal	*Anas crecca*	c			
American Black Duck	*Anas rubripes*	o			
Mottled Duck	*Anas fulvigula*	s			
Mallard	*Anas platyrhynvchos*	a			
Northern Pintail	*Anas acuta*	o			
Blue-winged Teal	*Anas discors*	u	u		u
Northern Shoveler	*Anas clypeata*	o			
Gadwall	*Anas strepera*	c			
American Wigeon	*Anas Americana*	c			
Canvasback	*Aytha valisineria*	r			
Redhead	*Aythya Americana*	r			
Ring-necked Duck	*Aythya collaris*	c			
Lesser Scaup	*Aythya affinis*	r			
Hooded Merganser*	*Lophodytes cucullatus*	u	u	u	u
Ruddy Duck	*Oxyura jamaicensis*	s			s
Vultures, Hawks, Eagles, Falcons and Allies					
Black Vulture	*Coragyps atratus*	c	u	u	u
Turkey Vulture*	*Cathartes aura*	c	c	c	c
Osprey	*Pandion haliaetus*	o	o	o	
Bald Eagle*	*Haliaeetus leucocephalus*	o	o		
Swallow-tailed Kite	*Elanoides forficatus*		u	u	
Mississippi Kite	*Ictinia mississippiensis*			u	u
Northern Harrier	*Circus cyaneus*	o			o
Sharp-shinned Hawk	*Accipiter striatus*	o			o
Cooper's Hawk	*Accipiter cooperii*	o			o
Red-shouldered Hawk*	*Buteo lineatus*	u	u	u	u
Broad-winged Hawk	*Buteo platypterus*		o	o	
Red-tailed Hawk	*Buteo jamaicensis*	u			
American Kestrel*	*Falco sparverius*	u	o	o	u
Partridges, Grouse, Turkeys, and Old World Quail					
Wild Turkey*	*Meleagris gallopavo*	u	u	u	u
Gallinaceous Birds (Quail,Turkey, and Allies)					
Northern Bobwhite	*Colinus virginianus*	r	r	r	r
Rails, Gallinules, Coots, and Cranes					
King Rail	*Rallus elegans*	s	s	s	s
Virginia Rail	*Rallus limicola*	s			
Sora	*Porzana carolina*	s			
Purple Gallinule*	*Porphyrio martinica*		u	u	
Common Moorhen*	*Gallinula chloropus*		u	u	
American Coot	*Fulica Americana*	a	c		

Common Name	Scientific Name	W	Sp	Su	F
Lapwings and Plovers					
Killdeer	*Charadrius vociferous*	c			c
Sandpipers, Phalaropes and Allies					
Lesser Yellowlegs	*Tringa flavipes*	r			
Spotted Sandpiper	*Actitis macularia*		o		o
Least Sandpiper	*Calidris minutilla*	s	s		s
Common Snipe	*Gallinago gallinago*	u			
American Woodcock	*Scolopax minor*	s	s		
Skuas, Gulls, Terns and Skimmers					
Laughing Gull	*Larus atricilla*		r		
Bonaparte's Gull	*Larus Philadelphia*	s			
Ring-billed Gull	*Larus delawarensis*	s			
Herring Gull	*Larus argentatus*	s			
Caspian Tern	*Sterna caspia*		r	r	
Pigeons and Doves					
Mourning Dove*	*Zenaida macroura*	u	u	u	u
Cuckoos					
Yellow-billed Cuckoo*	*Coccyzus americanus*		c	c	r
Owls					
Barn Owl	*Tyto alba*	s			
Eastern Screech Owl*	*Megascops asio*	o	o	s	s
Great Horned Owl	*Bubo virginianus*	o	o	o	o
Barred Owl*	*Strix varia*	u	u	u	u
Goatsuckers					
Chuck-will's widow	*Caprimulgus carolinensis*		o	o	
Swifts					
Chimney Swift	*Chaetura pelagica*		u	u	o
Hummingbirds					
Ruby-throated Hummingbird	*Archilochus colubris*		o	o	
Kingfishers					
Belted Kingfisher*	*Megaceryle alcyon*	u	u	u	u
Woodpeckers and Allies					
Red-headed Woodpecker*	*Melanerpes erythrocephalus*	c	c		c
Red-bellied Woodpecker*	*Melanerpes carolinus*	a	a	a	a

Common Name	Scientific Name	W	Sp	Su	F
Yellow-bellied Sapsucker	*Sphyrapicus varius*	u			o
Downy Woodpecker*	*Picoides pubescens*	c	c	c	c
Hairy Woodpecker*	*Picoides villosus*	u	u	u	u
Northern Flicker*	*Colaptes auratus*	c	o		c
Pileated Woodpecker*	*Dryocopus pileatus*	c	c	c	c
Flycatchers					
Eastern Wood-Pewee	*Contopus virens*		u	u	u
Acadian Flycatcher*	*Empidonax virescens*		c	c	r
Eastern Phoebe	*Sayornis phoebe*	a			a
Great Crested Flycatcher*	*Myiarchus crinitus*		c	c	
Eastern Kingbird*	*Tyrannus tyrannus*	c	c	c	c
Shrike					
Loggerhead Shrike	*Lanius ludovicianus*	s	s	s	s
Swallows					
Purple Martin	*Progne subis*		u	u	
Northern Rough-winged Swallow*	*Stelgidopteryx serripennis*			c	u
Barn Swallow	*Hirundo rustica*		o		
Jays and Crows					
Blue Jay*	*Cyanocitta cristata*	c	u	u	c
American Crow*	*Corvus brachyrhynchos*	a	a	a	a
Fish Crow*	*Corvus ossifragus*	c	c	c	c
Chickadees and Titmice					
Carolina Chickadee*	*Parus carolinensis*	a	a	a	a
Tufted Titmouse*	*Parus bicolor*	a	a	a	a
Nuthatches					
Brown-headed Nuthatch	*Sitta pusilla*			r	
Creepers					
Brown Creeper	*Certhia americana*	s			
Wrens					
Carolina Wren*	*Thryothorus ludovicianus*	c	c	c	c
Winter Wren	*Troglodytes troglodytes*	u			u
House Wren	*Troglodytes aedon*		s		r
Kinglets					
Golden-crowned Kinglet	*Regulus satrapa*	r			r
Ruby-crowned Kinglet	*Regulus calendula*	c	u		u

Common Name	Scientific Name	W	Sp	Su	F
Old World Warblers and Gnatcatchers					
Blue-gray Gnatcatcher	*Polioptila caerulea*		u	o	
Bluebirds, Thrushes and Robins					
Eastern Bluebird*	*Sialia sialis*	c	u	u	
Hermit Thrush	*Catharus guttatus*	r			
Wood Thrush*	*Hylocichla mustelina*	u	r	u	
American Robin	*Turdus migratorius*	a			
Thrashers, Mockingbirds and Allies					
Gray Catbird	*Dumetella carolinensis*		u		c
Brown Thrasher	*Toxostoma rufum*	u		r	u
Northern Mockingbird	*Mimus polyglottos*	r			r
Pipits					
American Pipit	*Anthus rubescens*	o			
Waxwings					
Cedar Waxwing	*Bombycilla cedrorum*	u			
Starling					
European Starling*	*Sturnus vulgaris*	o	o		
Vireos					
White-eyed Vireo*	*Vireo griseus*	u	a	c	u
Blue-headed Vireo	*Vireo solitarius*	r			
Yellow-throated Vireo	*Vireo flavifrons*		u	o	
Red-eyed Vireo*	*Vireo olivaceus*		a	c	
Wood warblers					
Blue-winged Warbler	*Vermivora pinus*				r
Yellow Warbler	*Dendroica petechia*		r		
Magnolia Warbler	*Dendroica magnolia*				r
Yellow-rumped Warbler	*Dendroica coronata*	a	c		c
Black-throated Green Warbler	*Dendroica virens*				r
Yellow-throated Warbler*	*Dendroica dominica*		c	o	
Pine Warbler	*Dendroica pinus*	u	o		o
Prairie Warbler	*Dendroica discolor*		r		
Blackpoll Warbler	*Dendroica striata*		r		
Black-and-white Warbler	*Mniotilta varia*		r		r
American Redstart*	*Setophaga ruticilla*		a	u	u
Prothonotary Warbler*	*Protonotaria citrea*		a	u	o
Swainson's Warbler	*Limnothlypis swainsonii*		s		
Ovenbird	*Seiurus aurocapilla*				r

Common Name	Scientific Name	W	Sp	Su	F
Louisiana Waterthrush	*Seiurus motacilla*		s		
Kentucky Warbler*	*Oporornis formosus*		u	o	
Hooded Warbler*	*Wilsonia citrine*		c	u	o
Yellow-breasted Chat*	*Icteria virens*		c	o	
Northern Parula*	*Parula americana*		a	c	r
Common Yellowthroat*	*Geothlypos trichas*	c	c	o	c
Tanagers					
Summer Tanager*	*Piranga rubra*		c	o	
Scarlet Tanager	*Piranga olivacea*		o		
Sparrows					
Eastern Towhee	*Pipilo erythrophthalmus*	u	o		o
Chipping Sparrow	*Spizella passerine*	o	r		
Savannah Sparrow	*Passerculus sandwichensis*	u			
Fox Sparrow	*Passerella iliaca*	s			
Song Sparrow	*Melospiza melodia*	c			o
Swamp Sparrow	*Melospiza Georgiana*	c			o
White-throated Sparrow	*Zonotrichia albicollis*	a	c		o
Dark-eyed Junco	*Junco hyemalis*	s			
Cardinals, Saltadors and Allies					
Northern Cardinal*	*Cardinalis cardinalis*	a	a	a	a
Rose-breasted Grosbeak	*Pheucticus ludovicianus*		r		
Blue Grosbeak	*Guiraca caerulea*		r		o
Indigo Bunting*	*Passerina cyanea*		a	c	a
Blackbirds, Grackles, Cowbirds and Orioles					
Bobolink	*Dolichonyx oryzivorus*		u		
Red-winged Blackbird*	*Agelais phoeniceus*	a	c	c	a
Eastern Meadowlark	*Sturnella magna*	r			
Common Grackle*	*Quiscalus quiscula*	u	o	o	u
Brown-headed Cowbird*	*Molothrus ater*	u	o	o	o
Orchard Oriole	*Icterus spurious*		o	o	
Baltimore (Northern) Oriole	*Icterus galbula*		s		
Old World Finches					
Purple Finch	*Carpodacus purpureus*	s			
House Finch	*Carpodacus mexicanus*		s	s	
Pine Siskin	*Carduelis pinus*	s	s		
American Goldfinch	*Carduelis tristis*	c	c		

KEY

Seasonal Appearance

W – Winter: December, January, February
Sp – Spring: March, April, May
Su – Summer: June, July, August
F – Fall: September, October November

Seasonal Abundance

a - *abundant* (a common species which is very numerous

c - *common* (certain to be seen in suitable habitat)

u - *uncommon* (present but not certain to be seen)

o - *occasional* (seen only a few times during the season)

s - *suspected* (not recorded on the Refuge itself yet, but suspected but may occur based on nearby records.

X - *accidental* (out of normal species range)

* - known or suspected to have nested on Refuge on known to nest locally.

Appendix VIII. Existing and Potential Partners

Existing Partners

U.S. Army Corps of Engineers, Coffeeville Lock and Dam
Alabama Division of Wildlife and Freshwater Fisheries
The Nature Conservancy, Inc.
Local law enforcement agencies
Local citizens and neighbors

Potential Partners

Additional local residents
Additional local officials
Additional local, regional, state and national conservation groups and chapters

Appendix IX. Section 7 Evaluation

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Division/Office: Choctaw NWR

Refuge Manager/Phone #: Robbie Dailey (251)246-3583)

Date: April 28, 2005 Comprehensive Conservation Plan

I. Proposed Action: Implementation of the Comprehensive Conservation Plan.

The U.S. Fish and Wildlife Service (Service) has developed a Draft Comprehensive Conservation Plan (CCP) to provide a foundation for the management and use of Choctaw National Wildlife Refuge (Refuge). The plan is intended to serve as a working guide for the Refuge's management programs and actions over the next 15 years.

II. Location (County and State/attach project area map):

Choctaw Refuge is located in Choctaw County in southwest Alabama, eighty miles north of Mobile on the west bank of the Tombigbee River. The Refuge boundary starts two river miles upstream from the Coffeeville Lock and Dam.

III. Description of proposed action (describe in enough detail to allow proper evaluation of project impacts, attach additional pages as needed):

The plan's overriding consideration is to carry out the purposes for which the refuge was established. Fish and wildlife are the first priority in refuge management, and public use (wildlife-dependent recreation) is allowed and encouraged as long as it is compatible with, or does not detract from, the refuge's mission and purposes.

Individual consultations will occur under Section 7 for projects related to endangered species and are not intended to be covered in this document. This CCP prioritizes wildlife and habitat management, and proposes wildlife-dependent, compatible recreational opportunities. Chapter 4 of the CCP outlines specific goals, objectives and strategies to achieve an expanded wildlife and habitat management approach, while optimizing (making the best use of) public use and environmental education opportunities. While seeking concurrences on the general management direction of the refuge, as stated previously, individual consultations will occur for projects specifically related to endangered species and critical habitat.

IV. Species and Habitats Considered:

A. List all federally endangered, threatened, proposed, and candidate species, and describe any associated critical or proposed critical habitat that may be affected by the proposed action. Make a determination of how the proposed action may affect each:

SPECIES/CRITICAL HABITAT	STATUS[1]	DETERMINATION[2]			RESPONSE REQUESTED[3]
		NE	NA	AA	
Bald eagle	T		X		
Wood stork	E		X		

[1]STATUS: E = endangered, T = threatened, PE = proposed endangered, PT = proposed threatened, CH = critical habitat, PCH = proposed critical habitat, C = candidate species

[2]DETERMINATION:

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources.

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat.

[3]RESPONSE REQUESTED: conference, concurrence, formal consultation

V. Determination of effects:

A. Explanation of effects of the action: include direct, indirect, interrelated, interdependent, and cumulative effects (attach additional pages as needed):

Definitions for Effects of the Action:

Direct Effects = are those that are an immediate result of the action.

Indirect Effects = are those that are caused by the action and are later in time but are still reasonably certain to occur. They include the effects of future activities that are induced by the action and that occur after the action is completed.

Interrelated = are those that are part of a larger action and depend on the larger action for their justification.

Interdependent = are those that have no significant independent utility apart from the action that is under consideration.

Cumulative Effects = are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area.

The proposed CCP should benefit the listed species.

B. Explanation of actions to be implemented to reduce adverse effects:

n/a

VI.

Project Leader: _____ _____
Signature Date

No effect:_____

Is not likely to adversely affect:_____

Is likely to adversely affect:_____

VII. Reviewing Ecological Services Office(ESO) Evaluation:

A. Concurrence ___ Nonconcurrence

B. Formal Consultation Required

C. Conference Required

D. Remarks (attach additional pages if needed):

VIII. Signatory Approval:

ES Supervisor: _____
Signature Date:

Note: The process ends here if the proposed action is "not likely to adversely affect".

REFUGE CHIEF :

Signature Date

ARD Ecological Services:

Signature Date

Note: These signatures are required for approval of a conference report or biological opinion.

Appendix X. Wilderness Review Summary

Wilderness Review
Choctaw National Wildlife Refuge

August 4, 2005

The Planning Team met at Choctaw National Wildlife Refuge in late March, 2004, to gather information and conduct field exams for the refuge's wilderness review. The review team included:

Robbie Dailey, Refuge Manager
Mike Dawson, Refuge Planner
Leon Kolankiewicz, Consultant

The wilderness review is a required component of the comprehensive conservation plan.
The 1964 Wilderness Act defines a Wilderness Area as an area of federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is managed so as to preserve its natural conditions and which:

1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;

2) has outstanding opportunities for solitude or primitive and unconfined type of recreation;

3) has at least 5,000 contiguous roadless acres or is of sufficient size to make practicable its preservation and use in an unimpaired condition, or is a roadless island;

4) does not substantially exhibit the effects of logging, farming, grazing, or other extensive development or alteration of the landscape, or its wilderness character could be restored through appropriate management, at the time of review; and

5) may contain ecological, geological, or other features of scientific, education, scenic, or historic value.

During the inventory phase of the wilderness review, the emphasis is on an assessment of wilderness character within the inventory unit. Special values (i.e., ecological, geological, scenic, historical) should be identified, but are not required. The determination to recommend (or not recommend) a Wilderness Study Area to Congress for wilderness designation will be made through the comprehensive conservation plan decision-making process.

Summary of Wilderness Inventory Findings

The wilderness review inventory team could not identify any refuge units that would meet the criteria for a wilderness study area. The entire refuge is less than the 5,000-acre threshold specified by the Wilderness Act.

Choctaw National Wildlife Refuge USFWS
Robert Dailey - Refuge Mananger

P.O. Box 808
Jackson, AL 36545

Phone: (251) 246-3583
FAX: (251) 246-5414
E-mail: choctaw@fws.gov

U.S. Fish & Wildlife Service
1 800/344 WILD
http://www.fws.gov

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